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Soil Survey
of
Wilcox County, Alabama

By

G. A. SWENSON, in Charge, M. J. EDWARDS
B. H. WILLIAMS, A. L. GRAY, and W. J. LEIGHTY
United States Department of Agriculture

and

M. E. STEPHENS, M. C. CROFT, and L. G. BRACKEEN
Alabama Department of Agriculture and Industries



Bureau of Chemistry and Soils

In cooperation with the
Alabama Department of Agriculture and Industries

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SOIL SURVEY OF WILCOX COUNTY, ALABAMA

By G. A. SWENSON, in Charge, M. J. EDWARDS, B. H. WILLIAMS, A. L. GRAY, and
W. J. LEIGHTY, United States Department of Agriculture; and M. E.
STEPHENS, M. C. CROFT, and L. G. BRACKEEN, Alabama
Department of Agriculture and Industries

COUNTY SURVEYED

Wilcox County is in the southwestern part of the State (fig. 1). Camden, the county seat, situated in the central part of the county, is approximately 30 miles southwest of Selma, 65 miles southwest of Montgomery, and 100 miles northeast of Mobile. The county is somewhat irregular in shape. Its maximum length east and west, measured on a line passing through Camden, is 48 miles, and the maximum width north and south is 30 miles, measured in the vicinity of Catherine. It contains 896 square miles or 573,440 acres.

The original physiography of the county, before it was changed by Alabama River, its tributaries, and other agencies of erosion, was that of a flat coastal plain. The present bed of Alabama River lies

approximately 400 to 500 feet below small plateaus that are remnants of the original plain. The largest four of these plateaus are at Dry Forks, about half a mile northwest of Reeves Chapel, about half a mile northeast of the same place, and on the hilltops at Oakhill. Other small areas of this elevation are scattered throughout

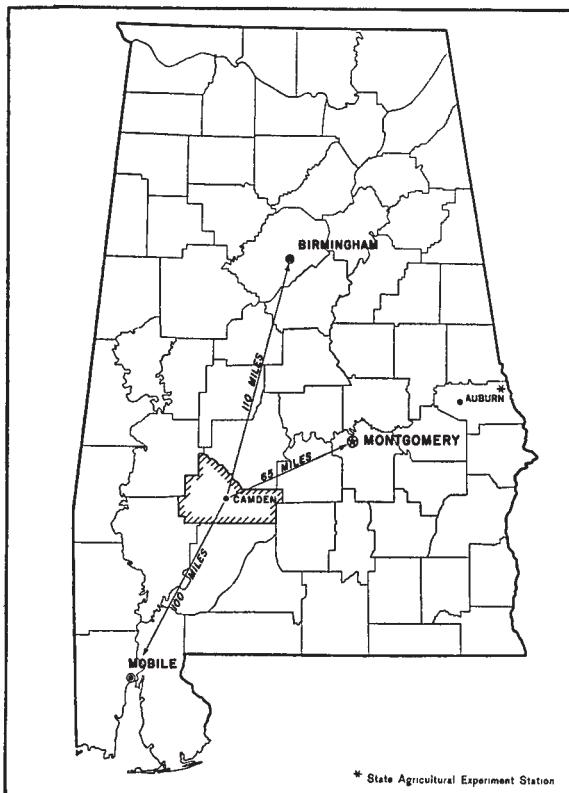


FIGURE 1.—Sketch map showing location of Wilcox County, Ala.

* State Agricultural Experiment Station

the rough uplands northeast of Camden, east of Pine Apple, near the Butler County line, near Furman and Ackerville, and west of Ackerville.

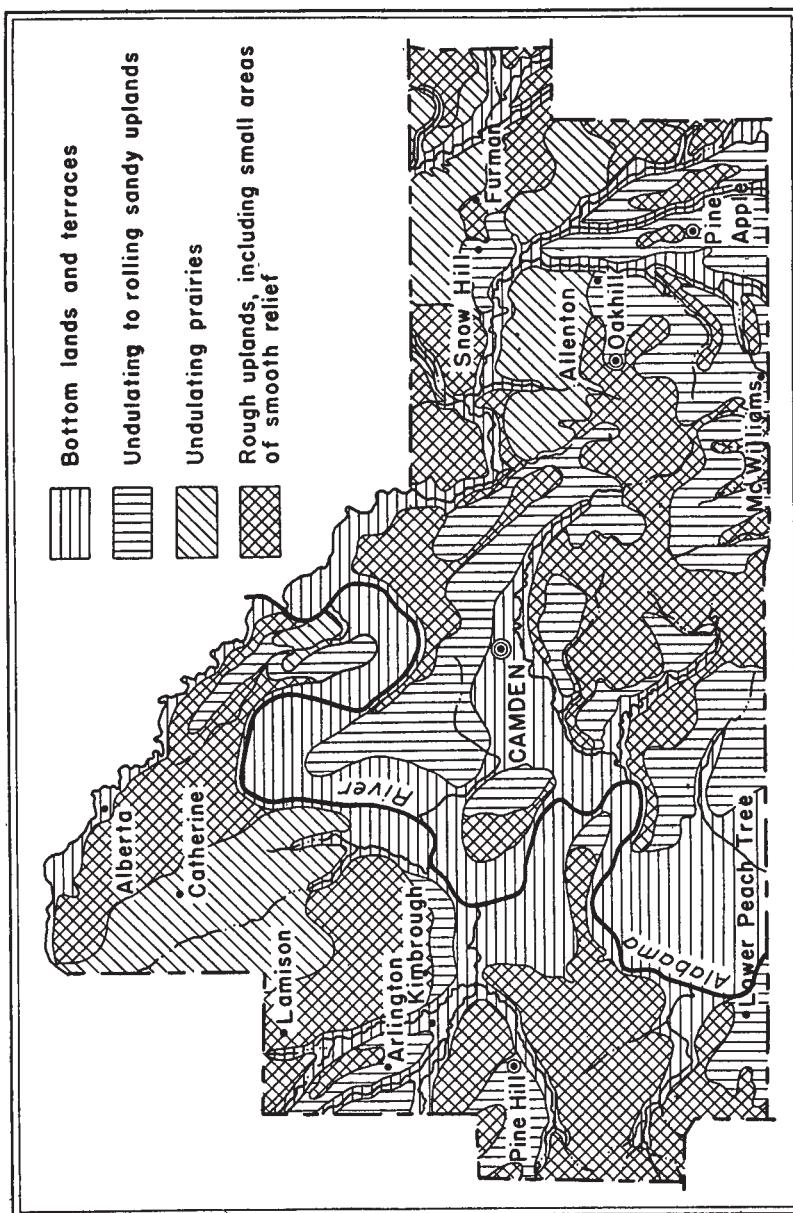


FIGURE 2.—Sketch map showing physiographic features of Wilcox County, Ala.

The present physiographic features of the county can best be shown by dividing them into four groups as indicated in figure 2. Each group represents some salient feature: (1) Bottom lands, or flood lands, and terraces, (2) undulating to rolling sandy uplands,

(3) undulating prairies, and (4) all areas that are predominantly rough broken lands.

The first of these groups, which is the largest, follows Alabama River and its tributaries and extends from 2 to 6 miles in width along the river and in many places more than a mile in width along some of the larger creeks. The topography of this group is gently undulating to flat.

The second group includes most of the smoother uplands. This group is in the large bends of the river north of Camden and south of Dry Forks, where it occupies the older and higher river terraces which have lost their alluvial characteristics and are now classed as upland. It also lies south of Snow Hill and in the southeastern and other parts of the county, where it occupies gently undulating to gently rolling ridge tops with rounded slopes, fan-shaped areas on low plateaus, or gentle slopes. North of McWilliams several areas of this group with otherwise flat to undulating topography are penetrated by deep V-shaped gullies; this condition is due to a thin layer of erosion-resistant buhrstone underlying the surface.

The third and smallest group consists of the smoother soils of the prairies and associated clay soils, situated principally northwest and east of Furman, south and east of Darlington, northeast and east of Allenton, and around Catherine. The relief in the prairie areas is that of broad, undulating plateaus with rounded slopes in the east-central and northeastern parts of the county and of low, broad, nearly flat, long ridges between intermittent drains west of Alabama River. The general topography of the prairie areas is smoother west of Alabama River than in other parts of the county.

The fourth group consists of the broken, hilly, and steep areas and a few small, rough areas in the prairie sections, as well as small scattered areas of smooth relief. It is the second largest of these groups and is distributed throughout the county, the largest areas being in the south-central part, where they are known locally as the "Grampian Hills", and in the western part. The lands of this group that slope to the north are generally very steep and rugged, with many deep, V-shaped gullies which extend from the bases of the slopes to the crests of the hills, whereas those that slope to the south are more gentle.

The county lies wholly within the drainage basin of Alabama River, which enters the county from the north and runs southwest in large sweeping curves. Tributaries extend into all parts of the county and afford excellent outlets to surplus water. Surface drainage is good on the more gently rolling uplands and higher terraces, fair to poor on the bottom lands, and generally excessive in the rough uplands. The main tributaries are evenly distributed. Those in the eastern and northeastern parts of the county flow northwest, and those in the northwestern part flow southeast. In the southwest and west-south-central parts, the streams west of the river flow east and those east of the river flow southwest.

Alabama River enters Wilcox County at the mouth of Pine Barren Creek 39 feet above sea level and leaves the county about 3 miles below Lower Peach Tree 17 feet above sea level, according to the United States Army survey. The measurements were based on low water level. The average height of the lowland banks of the river is 50 feet above low water level. The east bank south of Clifton

Ferry is approximately 50 to 55 feet above the river at low stage. The west bank is about 35 feet higher than the east bank. The United States Coast and Geodetic Survey gives the following elevations: Along the Southern Railroad, Sunny South, 165 feet; Pine Hill, 111 feet; Kimbrough, 118 feet; Flatwood, 178 feet; Catherine, 193 feet; Gastonburg, 219.8 feet; and Alberta, 171.4 feet above sea level. The triangulation station of the Coast and Geodetic Survey, half a mile south of Fatama, is 548.6 feet above sea level. It is estimated that the highest point in the county is not more than 575 feet above sea level. The Louisville & Nashville Railroad enters the county near McWilliams at an elevation of 411 feet, is 406 feet at McWilliams, and is 315 feet at Pine Apple Station.

With the exception of the prairie section, the entire county was originally covered by forest. Bottom lands were covered principally by water oak, willow oak, pin oak, black gum, sweetgum, ash, elm, willow, hickory, hackberry, magnolia, ironwood, beech, sycamore, and haw, with poplar and white oak on the slopes of stream banks and an underbrush of bamboo, rattan, and briars. The sandy uplands, including Susquehanna clay and Guin soils and the terraces, produced heavy stands of shortleaf and longleaf pines, and scattered hardwoods of post oak, red oak, black oak, hickory, sweetgum, and black gum and some dogwood and poplar. The vegetation of the "prairie" soils can best be described by dividing them into two groups, the calcareous and the noncalcareous. The calcareous group, with the exception of some areas east of Darlington and south of Furman, supported a scattered growth of cedar, walnut, hackberry, elm, and ash and an undergrowth of haw, briars, and plum bushes. On the other areas was a growth of cedars, and on some of the slopes were hardwoods such as hackberry, redbud, Osage-orange, poplar, white oak, dogwood, gums, hickory, and elm. The noncalcareous group, locally called the "post oak prairies", had a covering of post oak and shortleaf pine and a few other oaks, gums, hackberry, and hickory.

Wilcox County was organized December 13, 1819. It was formed from Dallas and Monroe Counties and named for Lt. Joseph M. Wilcox. There is good evidence that the aboriginal inhabitants were Maubila Indians, later known as Mobilians, a Choctaw-speaking people. Wilcox County was in the Creek Domain and became an American possession by the treaty of Fort Jackson, August 9, 1814. There may have been some settlers in 1815, but a considerable number came in 1816 and squatted on land which they cleared. Early settlers came from Virginia, North Carolina, South Carolina, and Georgia. The present population is chiefly native-born descendants of the early settlers. The total population as reported by the census of 1930 is 24,880. It is classed as rural and is divided into farm and nonfarm population. The farm population consists of 2,995 native-born whites, 7 foreign-born whites, and 17,393 Negroes.

Camden, the county seat, has a population of about 700. Snow Hill, Allenton, Pine Apple Station, McWilliams, Watsons Crossing, Neenah, Estelle, and Camden in the eastern part; Asahel, Coy, and Yellow Bluff in the southwestern part; and Alberta, Gastonburg, Catherine, Flatwood, Lamison, Arlington, Kimbrough, Pine Hill, and Sunny South in the western part of the county are railroad points or stations of local importance. Ackerville, Oakhill, Furman,

and Pine Apple in the east; Canton Bend, Millers Ferry, Darlington, and Fatama, in the central part; and Lower Peach Tree in the southwest are inland towns or trading points.

Three railroad systems cross the county: Louisville & Nashville, Southern, and St. Louis-San Francisco. These roads reach the railroad stations mentioned and provide rail transportation to all parts of the county. Very few parts of the county are more than 10 miles from a railroad station or shipping point. In addition, water transportation on Alabama River, although not so important as formerly, still offers facilities for shipping or receiving freight. The most important landing at the present time is at Lower Peach Tree. Bus and truck transportation connect several points within the county with neighboring towns and cities in the State.

The public roads of the county have been greatly improved in the last few years. The highways extending from the southeastern corner to Catherine in the northwest, from Camden south to the county line, and from Alberta to Sunny South are graveled, all-weather routes and are maintained by the State. Several county roads, graded and lightly surfaced with gravel or sandy clay, extend into all parts of the county. County roads are passable to motor cars except in extremely wet weather; however, in the heavy clay lands of the prairies and in the hilly sections, not all are surfaced and therefore many become impassable as soon as the surface is thoroughly wet. In addition, numerous local roads or trails are passable in good weather. Alabama River is crossed by one bridge, the Lee Long Bridge, northwest of Millers Ferry, and by ferries at several other points. Telephone lines reach all the important towns or centers of population, but at present only a few of the country homes are connected by telephone.

Five consolidated high schools, together with several combination junior high and elementary schools, are located in the county for the white population. The schools are centrally located to enable busses to reach all sections of each district. A large number of elementary schools for Negroes and several Negro institutes or academies are distributed throughout the county. Churches are well distributed. Mail deliveries by rural routes reach all parts of the county.

Lumbering is carried on in some places. In 1929, according to the 1930 census, 3,154,000 board feet of saw and veneer logs, 28,329 cords of wood, 695 cords of pulpwood, 77,007 fence posts, 1,108 railroad ties, and 486 poles and piling were cut in the county. Along Alabama River rafts of logs are floated to the sawmills and veneer mills in Mobile. Several lumber companies own large tracts of land in Wilcox County, especially in the south-central and southwestern parts, and cooperate with other private landowners in protecting the growing timber from fire. Lumbering is declining, as most of the virgin timber has been cut, but it will again become important, as large areas of second-growth timber have become well established.

At Catherine a factory cans okra, some soup mixtures, and a few vegetables and makes jellies and jams. This plant provides a limited market for the truck crops.

CLIMATE

The climate of Wilcox County is temperate as a result of the influence of the Gulf Stream. The variation in temperature between the

hottest days of summer and the coldest days of winter is fairly wide, the mean annual difference being about 34° . The summers are long and warm, but are generally tempered by cooling breezes, especially at night. The spring and fall seasons are usually free from extremes of heat or cold. The winters are normally pleasant, but warm pleasant days may be followed by rains, cold weather, and slight freezes. Very cold weather, however, is rare. The records show that snow and sleet may occur but are rare and of short duration.

Table 1 gives the monthly, seasonal, and annual temperatures and precipitation compiled from the records of the United States Weather Bureau station at Thomasville, Clarke County, which are representative of climatic conditions in Wilcox County.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Thomasville, Clarke County, Ala.*

[Elevation, 385 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1899)	Total amount for the wettest year (1932)	Snow, average depth
December.....	$^{\circ}$ F. 49.1	80	11	Inches 4.66	Inches 5.44	Inches 9.07	Inches (¹)
January.....	48.4	86	9	4.94	1.77	11.27	0.3
February.....	49.8	85	-5	5.03	2.71	6.83	.4
Winter.....	49.1	86	-5	15.23	9.92	27.17	.7
March.....	57.8	90	20	5.87	3.20	4.45	(¹)
April.....	64.8	96	29	3.95	.86	3.15	(¹)
May.....	72.7	102	38	4.25	.06	9.57	.0
Spring.....	65.1	102	20	14.07	4.12	17.17	(¹)
June.....	79.5	107	48	4.21	1.56	3.81	.0
July.....	81.0	105	56	5.66	9.16	4.89	.0
August.....	80.6	106	51	4.77	1.04	3.19	.0
Summer.....	80.4	107	48	14.64	11.76	11.89	.0
September.....	76.5	102	41	3.23	(¹)	8.96	.0
October.....	65.6	97	26	2.41	1.75	6.77	0
November.....	55.6	87	17	3.26	4.86	3.69	(¹)
Fall.....	65.9	102	17	8.90	6.61	19.42	(¹)
Year.....	65.1	107	-5	52.84	32.41	75.65	.7

¹ Trace.

The average date of the last killing frost in the spring is March 17, and of the first in the fall is November 11, giving an average growing season of 239 days for tender vegetation. Frost has been recorded as late as April 26 and as early as October 20. The length of the growing season differs somewhat between the high uplands and the bottom lands. This is not of great economic importance, although occasionally late frosts will destroy the early cotton on the lower levels.

The average annual precipitation is 52.84 inches. It is fairly well distributed throughout the year; however, the greatest amounts fall during the winter, and September, October, and November are the driest and therefore the most favorable months of the year for maturing and gathering the staple crops—corn and cotton. Precipitation is normally adequate for crop production, but periods of excessive rains or droughts are not uncommon and may do considerable damage but have never caused total loss of crops.

The climate is favorable for diversified farming. The winters are mild enough for successful growth of winter cover crops and for plowing and preparing seedbeds for spring planting. Hardy vegetables, such as turnips, mustard, collards, beets, cabbage, lettuce, onions, and radishes, can generally be grown in gardens during the winter, but they are occasionally killed by hard freezes. Native grasses do well and have a growing period of about 10 months, which is advantageous for livestock raising.

Occasionally severe windstorms, hailstorms, and tornadoes strike this area, according to the records of the Weather Bureau, but their occurrence is no more frequent or severe than in other areas in this part of the Gulf Coastal Plain. Storms most frequently occur in February, March, April, and May, but both hailstorms and tornadoes have occurred in other months.

AGRICULTURAL HISTORY AND STATISTICS

In 1816, early settlers of Wilcox County took up land along Alabama River and the larger streams, located their homes on the higher terraces and upland, and cleared the productive alluvial land for farming. As more settlers arrived the more desirable lands throughout the county were rapidly taken. The settlers' first concern was to provide the necessities of life; therefore they produced mainly food crops such as corn, wheat, oats, potatoes, and vegetables. A few livestock were pastured on open range. Cotton soon became the principal cash crop. It was first ginned and baled then hauled to the river landings and shipped to outside markets where it was sold or was exchanged for supplies. The early farmers used no commercial fertilizers but opened new lands when the yields on the old became unsatisfactory.

As land was cheap, many farmers acquired large holdings or plantations containing thousands of acres. After the Civil War the changed conditions of labor made it practically impossible to continue the old plantation system, and much of the land was operated by tenants. At present most of the land is still in large holdings and is worked by tenants. According to the 1935 Federal census, the 4,554 farms in Wilcox County were operated as follows: 19.8 percent by owners, 80 percent by tenants, and 0.2 percent by managers.

The county agent states that about 85 percent of the tenants in 1931 rented for cash and that the rental for smooth uplands and the higher river terraces was about \$4 an acre, for tillable hilly uplands about \$2.50 an acre, and for tillable prairie soils about \$4 an acre. The less productive lands rented for smaller amounts. Of the 3,462 tenants reported by the 1930 census, 2,573 were cash tenants and 889 rented on shares. Most of the share tenancy was on a basis of one-half of the crop, where labor and one-half of the fertilizer were furnished by the tenant, and seed, equipment, and one-half of the fertilizer were furnished by the landlord. A few farms rented for one-third of the cotton and one-fourth of the other crops. Individual arrangements were made whereby the tenant paid his rent in a specified number of pounds of lint cotton an acre.

When the price of cotton was high the average tenant produced mainly cotton as a cash crop and very little corn, hay, or other food and feed crops for his family or for his work animals. When the price of cotton fell to a point where there was little or no profit in its

production, the tenants were unable to buy their usual food and feed supplies. To remedy that condition they were urged to grow less cotton and to plant more corn and other food and feed crops. At present, the better and more progressive tenants still produce cotton as a cash crop, but they also grow corn to feed work animals, to fatten hogs, and for home use. They grow sugarcane, sorgo, sweetpotatoes, vegetables, peanuts, hay, and other crops for food and feed.

Population increased from 31,828 in 1880 to 35,631 in 1900, dropped to 33,810 in 1910, and steadily decreased to 24,880 in 1930. The number of farms increased from 3,974 in 1880 to 6,661 in 1910 and then steadily decreased to 4,344 in 1929, followed by a slight increase to 4,554 in 1934. The average size of the farms diminished from 108 acres in 1880 to 56.8 acres in 1910, after which it increased to 72.5 acres in 1930, and to 80.8 acres in 1935. These changes were due in part to the advent of the cotton boll weevil. Since its appearance beef cattle production has increased, and the number of tenants and small land-owners has decreased.

Many of the farms operated by the owners have good dwellings, large barns, and sheds for livestock, and some of the larger places are equipped with electric lights and running water. Improved machinery is used by a very small proportion of the farmers. A few tractors with tractor equipment, plows, harrows, and disks are in use. The tenant farms, as a rule, have poor buildings and the simplest kind of equipment. The tenant with one plow has in addition, a mule or horse, a wagon, a one-row fertilizer drill and seeder, and a few hand implements. For field work mules are used predominantly, but a few horses and occasionally oxen are used. Very few of the horses and mules are raised in the county.

Acreages occupied by the principal crops, taken from the Federal census, for the years 1879, 1889, 1899, 1909, 1919, 1929, and 1934 are given in table 2.

TABLE 2.—*Acreage of the principal crops in Wilcox County, Ala., in stated years*

Crop	1879	1889	1899	1909	1919	1929	1934
	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Cotton.....	77,076	91,597	97,967	107,480	52,498	44,952	25,112
Corn.....	40,053	37,075	46,029	35,173	46,526	32,022	40,625
Sweetpotatoes.....	1,597	2,081	1,682	1,768	2,368	1,828	2,603
Potatoes.....		32	62	360	123	77	86
Hay.....	42	384	855	3,082	5,716	3,949	6,556
Oats (threshed).....	7,011	3,931	2,445	1,906	1,111	29	114
Sugarcane and sorgo.....		1,666	1,235	1,444	1,786	1,130	1,501
Peanuts.....		107	271	366	836	726	1,484

¹ Does not include sorgo.

By comparing the data shown in table 2, some interesting trends can be traced. The acreage of cotton increased from 1879 to 1909, and then decreased until in 1934 it was less than one-fourth that of 1909, the acreages of corn and sweetpotatoes have remained more or less constant, oats have dropped from third place to one of the lowest places, and hay has risen from unimportance to third place.

All fruit trees show a steady decline since 1900. Pecans increased markedly to 5,939 trees in 1934.

The number of horses in the county has declined, and the number of mules has remained fairly constant. In 1934, 1,414 horses and 3,887 mules were on farms.

According to the Federal census for 1935, Wilcox County ranked third among the counties of the State in the production of cattle. The number of cattle and calves of all ages on farms January 1, 1935, was 39,862, a gain of 11,430 over the figure for April 1, 1930. A part of this gain must be attributed to the fact that prices were so low in the summer and fall of 1934 that most of the cattle were held over for the 1935 season in anticipation of better prices, and a part to the fact that the reduction of cotton acreage and the increase in the acreages of corn, hay, and pastures enabled the farmers to raise and feed more cattle. The quality of cattle has been improved by the introduction of better stock.

The same report shows a slight decrease in hogs and pigs from 17,140 April 1, 1930, to 16,771 January 1, 1935. This decrease can be accounted for by the fact that the 1935 census was taken as of January 1, before the spring crop of pigs was farrowed, and is compared with the census taken as of April 1, 1930, which would include a large percentage of the spring pigs of that year.

The acreage of all farm lands in 1934 totaled 367,772 acres, or 43,040 more than that reported for 1930.

The use of fertilizers increased continuously until 1929, as shown by the census statistics. The amount expended for fertilizers in 1879 was \$5,305; in 1889, \$26,222; in 1899, \$17,310; in 1909, \$96,275; in 1919, \$113,943; and in 1929, \$154,787. Since 1929 the amount of fertilizers used has decreased, but this is expected to be temporary, and as the times become more normal, the use of fertilizers probably again will show a steady increase.

Labor is plentiful, and the laborers are practically all Negroes. The average monthly wage ranges from \$12 to \$15 and board. In all instances houses are supplied rent-free.

According to the county agent, most of the owners and about 60 percent of the tenants keep one or more milk cows to supply the milk, cream, and butter for domestic use. For this purpose the Jersey breed is the most popular. The type of hog raised has shown a steady improvement over the once common "piny woods" hog. The most common breeds are Poland China and Duroc-Jersey. Sheep raising is carried on to a limited extent but is not popular with the tenants. About 350 lambs were marketed in 1931. Goats are more commonly raised by the tenants, as they are hardier and more self-sustaining. Chickens and guinea fowls are generally kept by both owners and tenants. Considerable revenue is derived from the sale of chickens and eggs. In 1934, 129,720 chickens were raised and 172,005 dozen eggs produced. Turkey raising is fairly common among tenants, but most of the turkeys are produced by landowners. In 1931 about five carloads of live turkeys were marketed for about \$12,600.

Some cash is obtained by landowners from the sale of lumber. In 1934, 3,154,000 board feet of lumber were cut. Some pulpwood, cross ties, poles, piling, and fence posts were sold.

SOIL-SURVEY METHODS AND DEFINITIONS

The soil survey of Wilcox County was made to obtain a modern classification of the soils; to show the distribution and location of the soils suitable for the growing of crops, pastures, and trees; to enable

persons interested in the use of the soils to select and adapt more readily for use on their own lands such crops and methods as have proved successful on similar soils in other parts of the State or in other parts of the Coastal Plain; and to aid such agencies as the State experiment station, State extension service, State forestry department, and the county agent to furnish more specific suggestions concerning the use and improvement of the soils in this county.

Soil surveying consists of the examination, classification, and mapping of soils in the field.

The soils are examined systematically in many locations. Test pits are dug, borings are made, and exposures, such as those in road or railroad cuts, are studied. Each excavation exposes a series of distinct soil layers or horizons called, collectively, the soil profile. Each horizon of the soil, as well as the parent material beneath the soil, is studied in detail; and the color, structure, porosity, consistence, texture, and content of organic matter, roots, gravel, and stone are noted. The reaction of the soil¹ and its content of lime and salts are determined by simple tests. The drainage, both internal and external, and other external features, such as the relief or lay of the land, are taken into consideration, and the interrelation of soils and vegetation is studied.

The soils are classified according to their characteristics, both internal and external, special emphasis being given to those features influencing the adaptation of the land for the growing of crop plants, grasses, and trees. Upon the basis of these characteristics, soils are grouped into mapping units. The three principal ones are: (1) Series, (2) type, and (3) phase. In places two or more of these principal units may be in such intimate or mixed pattern that they cannot be clearly shown separately on a map but must be mapped as (4) a complex. Areas of land, such as coastal beach or bare rocky mountain sides, which have no true soil are called (5) miscellaneous land types.

The most important of these groups is the series, which includes soils having the same genetic horizons, similar in their important characteristics and arrangement in the soil profile, and developed from a particular type of parent material. Thus the series includes soils having essentially the same color, structure, and other important internal characteristics and the same natural drainage conditions and range in relief. The texture of the upper part of the soil, including that commonly plowed, may vary within a series. The soil series are given names of places or geographic features near which they were first found. Thus Norfolk and Susquehanna are names of important soil series.

Within a soil series are one or more soil types, defined according to the texture of the upper portion of the soil. Thus the class name of the soil texture, such as sand, loamy sand, sandy loam, loam, silt loam, clay loam, silty clay loam, and clay is added to the series name to give the complete name of the soil type. For example, Susquehanna fine sandy loam and Susquehanna clay are soil types within the Susquehanna series. Except for the texture of the surface soil, these soil types have approximately the same internal and

¹The reaction of the soil is its degree of acidity or alkalinity expressed mathematically as the "pH value." A pH value of 7 indicates precise neutrality; higher values indicate alkalinity and lower values, acidity.

external characteristics. The soil type is the principal unit of mapping and because of its specific character is usually the soil unit to which agronomic data are definitely related.

A phase of a soil type is a subgroup of soils within the type which differ from the type in some minor soil characteristic that may, nevertheless, have an important practical significance. Differences in relief, stoniness, and the degree of accelerated erosion are frequently shown as phases. Thus, for example, within the normal range of relief for a soil type, there may be portions which are adapted to the use of machinery and the growth of cultivated crops and other portions which are not. Even though there may be no important differences in the soil itself or in its capability for the growth of native vegetation throughout the range in relief, there may be important differences in respect to the growth of cultivated crops. In such an instance the more sloping portions of the soil type may be segregated on the map as a sloping or hilly phase. Similarly, soils having differences in stoniness may be mapped as phases even though these differences are not reflected in the character of the soil or in growth of native plants.

The soil surveyor makes a map of the county or area, showing the location of each of the soil types, phases, complexes, and miscellaneous land types, in relation to roads, houses, streams, lakes, section and township lines, and other local cultural and natural features of the landscape.

SOILS AND CROPS

Wilcox County is one of the important agricultural counties in the southwestern part of the State, especially in the production of beef cattle. The trend in agricultural development in the county is toward the raising of beef cattle, the production of vegetables for canning purposes, and a more diversified agriculture. Prior to the appearance of the boll weevil, the prairie soils were used almost exclusively for the production of cotton and were considered some of the best soils in the State for this crop. They returned good yields without the addition of fertilizer.

Corn and cotton are the largest and most important crops grown in the county. Cotton is still the most important cash crop, although the acreage planted to corn is larger than that used for cotton. In 1935, 25,112 acres were devoted to the production of cotton, a large decrease from the acreage in 1930. Corn was planted on 40,671 acres and was used mainly for the fattening of hogs, the feeding of work animals, and meal for home use.

In the aggregate, a considerable acreage is used for the production of sweetpotatoes, cowpeas, velvetbeans, and peanuts, and a small acreage for oats. Sugarcane and sorgo (sweet sorghum) are grown for home use and to supply local markets. Around every well-established home, garden vegetables, pecans, and some fruits are grown. Several other crops are grown and sold to the canning factory at Catherine. According to the 1935 census, Wilcox County ranked third in the number of beef cattle in the State, having 39,862 head. A large number of hogs and pigs are raised. The county has 77,859 acres of plowable pasture, 80,247 acres of woodland pasture,

and 6,966 acres devoted to the production of hay and forage crops. The cropland is estimated as 82,023 acres.

The large number of different soils developed in the county is due mainly to several underlying geologic formations as well as to soil-forming processes. These soils vary considerably in texture from place to place, ranging from heavy clays through the mellow friable fine sandy loams to sands. The large areas of good fine sandy loam soils are well adapted to the production of cotton and to a wide variety of general farm crops. The "prairie soils"² and associated clay soils and some of the soils in the first bottoms and on the second bottoms or terraces are used mainly for pasture grasses and corn. Soils and land types that have a rough broken relief and are eroded and gullied are best suited for forestry. In many places in the county a clear relationship exists between the agriculture and the character of the soils.

The soils can be grouped into three general classes, according to their soil characteristics and agricultural uses, as follows: (1) Sandy soils of the uplands and river terraces, (2) heavy soils of the uplands and prairies, and (3) miscellaneous soils and land types. In the following pages of this report the soils of the county are described in detail and their agricultural relationships are discussed, their location and distribution are shown on the accompanying soil map, and their acreage and proportionate extent are given in table 3.

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Wilcox County, Ala.*

Type of soil	Acres	Per-cent	Type of soil	Acres	Per-cent
Ruston fine sandy loam	13,824	2.4	Oktibbeha clay.....	6,400	1.1
Ruston fine sandy loam, hilly phase	28,992	5.1	Wilcox clay.....	10,176	1.8
Orangeburg fine sandy loam.....	3,008	.5	Lufkin clay.....	9,088	1.6
Red Bay fine sandy loam.....	5,312	.9	Lufkin clay, mixed phase.....	1,536	.3
Red Bay fine sandy loam, hilly phase.....	2,580	.5	Vaiden fine sandy loam.....	5,696	1.0
Luverne fine sandy loam, mixed phase.....	5,312	.9	Lufkin clay loam.....	1,600	.3
Norfolk fine sandy loam.....	11,072	1.9	Catalpa clay.....	23,744	4.2
Norfolk loamy sand.....	6,912	1.2	Susquehanna clay.....	17,088	3.0
Norfolk fine sandy loam, poorly drained phase.....	2,432	.4	Susquehanna clay, hilly phase.....	66,880	10.6
Susquehanna fine sandy loam.....	23,424	4.1	Susquehanna fine sandy loam, hilly phase.....	18,072	3.4
Susquehanna very fine sandy loam.....	8,640	1.5	Guin fine sandy loam.....	4,160	.7
Amite fine sandy loam.....	2,176	.4	Guin soils, undifferentiated.....	54,720	9.6
Cahaba fine sandy loam.....	7,232	1.3	Oktibbeha clay, hilly phase.....	7,232	1.3
Cahaba loamy fine sand.....	2,818	.5	Oktibbeha fine sandy loam, hilly phase.....	4,800	.8
Wickham fine sandy loam.....	7,680	1.4	Sumter clay, hilly phase.....	12,160	2.1
Wickham silt loam.....	2,496	.5	Plummer fine sandy loam.....	1,024	.2
Kalma fine sandy loam.....	8,768	1.6	Leaf fine sandy loam, poorly drained phase.....	15,168	2.7
Kalma loamy fine sand.....	3,520	.6	Leaf silt loam.....	3,328	.6
Kalma very fine sandy loam.....	2,112	.4	Leaf clay loam.....	6,464	1.1
Kalma very fine sandy loam, poorly drained phase.....	2,368	.4	Myatt fine sandy loam.....	9,280	1.6
Leaf fine sandy loam.....	20,224	3.6	Ochlockonee clay loam.....	40,396	7.2
Ochlockonee fine sandy loam.....	15,872	2.8	Kalma sand.....	3,072	.6
Sumter clay.....	8,384	1.5	Augusta silt loam.....	4,928	.9
Sumter clay, mixed phase.....	5,056	.9	Meadow (alluvial material).....	27,776	4.9
Sumter clay loam, black-surface phase.....	3,520	.6	Swamp.....	4,800	.8
Bell clay.....	6,016	1.1	Riverwash.....	128	.1
Oktibbeha fine sandy loam.....	2,496	.5	Total.....	573,440	-----

² These soils, locally called "prairie soils", are not true Prairie soils, such as those of Iowa, in a strictly scientific sense. The presence, in the native vegetation, of grasses, responsible for their dark-colored surface soils and other properties of the soils, is due to the high content of soft calcareous (limy) material in the parent material from which the soils have developed. The general scientific name of such soils is Rendzina.

SANDY SOILS OF THE UPLANDS AND RIVER TERRACES

The group of soils of the sandy uplands, river terraces, and first bottoms, which are used largely for general farming, is a broad one.

The sandy soils of the uplands are Ruston fine sandy loam; Ruston fine sandy loam, hilly phase; Orangeburg fine sandy loam; Red Bay fine sandy loam; Red Bay fine sandy loam, hilly phase; Luverne fine sandy loam, mixed phase; Norfolk fine sandy loam; Norfolk fine sandy loam, poorly drained phase; Norfolk loamy sand; Susquehanna fine sandy loam; and Susquehanna very fine sandy loam. These soils cover 19.4 percent of the area of the county and are well distributed except in the southeastern end and in the prairie region.

Because the subsoils are friable fine sandy clays, practically all these upland soils are classed as fine sandy loams even though the surface soils are really loamy fine sands. These soils are light in color, badly leached of the mineral plant nutrients, and contain only a small amount of organic matter. They range from slightly acid to strongly acid.

These upland soils range in relief from smooth broad stream divides and plateau-like areas to comparatively flat-topped ridges and narrow winding ridges. They have the smoothest relief of the upland soils in the county. An exception to this relief is in the hilly phases of the Red Bay and Ruston fine sandy loams, where the surface is sloping to rolling, with a grade of from 6 to 20 percent. Natural surface drainage and internal drainage of these soils, with the exception of Susquehanna fine sandy loam and the poorly drained phase of Norfolk fine sandy loam, are good. This good drainage is due largely to favorable relief, high position, and underlying beds of unconsolidated sandy clays, sands, and sandy materials. Susquehanna fine sandy loam, however, is underlain by heavy clay, and internal drainage is impeded.

The upland soils of this group, because of their sandy texture, open structure, and good drainage, warm early in the spring and are the first soils in the county on which agricultural operations begin. The fine sandy clay subsoils are sufficiently heavy in texture to retain moisture and fertilizer and yet are sufficiently permeable to permit free movement of moisture in the surface soil and subsoil. These soils respond readily to applications of commercial fertilizer and barnyard manure and to turning under of green leguminous crops. They are very easily tilled with light farm implements and can be built up to a state of fair productivity.

These sandy upland soils are considered the good agricultural lands and are used for the production of a wide variety of crops. Most of the cotton, garden vegetables, sorgo, sugarcane, and fruits and much of the corn are produced on them.

Along Alabama River and some of the larger creeks are wide continuous areas of soils on the second bottoms, or terraces, and fairly large areas of soils on the first bottoms. These soils include Amite fine sandy loam; Cahaba fine sandy loam; Cahaba loamy fine sand; Wickham fine sandy loam; Wickham silt loam; Kalmia fine sandy loam; Kalmia loamy fine sand; Kalmia very fine sandy loam; Kalmia very fine sandy loam, poorly drained phase; Leaf fine sandy loam; and Ochlockonee fine sandy loam. These soils occupy 13.5 percent of the area of the county. Many of the soils developed on the

terraces, or second bottoms, correspond in color, texture, and structure to soils in the uplands, that is, the Amite corresponds in color to the Red Bay, the Cahaba to the Ruston, the Kalmia to the Norfolk, and the Leaf to the Susquehanna.

The materials forming the alluvial soils have been washed largely from the uplands in this and other counties in the coastal-plain section through which the streams flow, brought down, and deposited by the streams during time of overflow. Most of the material from which the Wickham soils were developed was brought down from the piedmont-plateau section.

All these sandy soils of the river terraces and first bottoms possess almost level to undulating relief, and, with the exception of Kalmia very fine sandy loam, poorly drained phase, and Leaf fine sandy loam, all of them are well drained. Ochlockonee fine sandy loam is subject to occasional overflow, but it is well drained for a soil occurring in the first bottoms. This soil is used principally for the production of corn, and large areas of the other soils are used for the growing of cotton and general farm crops.

Ruston fine sandy loam.—Ruston fine sandy loam is intermediate in color between Orangeburg and Norfolk fine sandy loams. The 6- to 8-inch surface soil is gray or brownish-gray loamy fine sand. The subsurface layer of brownish-yellow light fine sandy loam grades into yellowish-brown light fine sandy clay at a depth ranging from 12 to 15 inches. From 15 to 18 inches below the surface the subsoil becomes yellowish-red or reddish-brown friable fine sandy clay, which is generally uniform in color but may become mottled with bright red and yellow with depth. At a depth ranging from 50 to 70 inches the yellowish-red sandy clay gives way to brownish-yellow friable sandy clay mottled with bright red, yellow, and rusty brown, and splotched with heavy gray plastic clay, becoming more compact and brittle with depth. In some places this compact layer is lighter in texture than the layers above, but in others it becomes considerably tougher.

In general the depth and texture of the surface soil are uniform on the level areas, but vary considerably in areas where the relief is undulating to gently rolling and where the surface soil is not prevented from washing. On such areas the depth of the surface soil ranges from a few inches to 20 or more inches, and the texture varies from fine sandy loam in shallow places to loamy sand at the bases of slopes. This is true particularly of areas south of Canton Bend.

Areas of Norfolk fine sandy loam and Orangeburg fine sandy loam, which are too small to separate, are included on the soil map with Ruston fine sandy loam, and gravelly areas are indicated by gravel symbols superimposed on the type color. Soils in the gravelly areas are similar to the typical soil, except that they have a deeper and more open surface soil and subsoil due to a greater amount of coarse material. In a few areas the structure of gravelly spots approaches that of the gravelly Susquehanna fine sandy loam.

Ruston fine sandy loam is well distributed in all parts of the county. The larger areas are south of Canton Bend, southeast of Millers Ferry, 3 miles south of Dry Forks, and southeast of Oakhill.

From 90 to 95 percent of Ruston fine sandy loam is under cultivation, and about 80 percent of the cultivated area is in cotton. The

remainder is in corn, peanuts, sweetpotatoes, peas, beans, pecans, and other crops.

The yield of cotton varies greatly depending on seasonal conditions, cultural methods, and fertilizer applications. On tenant farms where the amount of fertilizer applied seldom exceeds 200 pounds an acre and where methods of soil improvement, such as turning under green-manure crops, are not followed, yields are comparatively low, about one-fourth to one-half bale an acre. The more progressive farmers apply from 400 to 600 pounds of 6-8-4³ fertilizer, as recommended for this soil by the experiment station at Auburn⁴ and quoted in this report in the section on Land Uses and Agricultural Methods.

Corn yields from 10 to 15 bushels an acre under ordinary cultural methods, but where it is given an application of 75 to 225 pounds of nitrate of soda an acre when it is about 2 feet high, the yields are greatly increased. The application of 225 pounds of nitrate of soda is recommended by the experiment station. Where a green-manure crop of vetch or Austrian Winter peas is turned under, the yields are often more than doubled; ranging from 25 to 50 bushels. In places, peas and velvetbeans are interplanted with corn or are given every third row. The yield of velvetbeans ranges from one-half to three-fourths ton. Peanuts are grown mainly for home use. They are either planted alone or may be interplanted with corn and grazed or hogged off. When planted alone they yield from 35 to 60 bushels an acre. Sweetpotatoes do very well on this type of soil, producing 75 to 200 bushels or more an acre, depending on the season and on the fertilizers applied. Yields of other crops are also good. Many pecan orchards, ranging from less than 1 acre to more than 5 acres, are planted on this soil and have a satisfactory tree growth and a good nut production.

Ruston fine sandy loam, hilly phase.—Ruston fine sandy loam, hilly phase, is separated from the typical soil because of its hilly and markedly sloping relief, amount of erosion, and greater variation in the soil profile. Where surface erosion has not been severe, the profile of the better developed areas of the hilly phase is similar to that of typical Ruston fine sandy loam. On many areas, however, surface erosion has removed all the loamy fine sand covering and exposed the reddish-yellow to yellowish-brown fine sandy clay. At the bases of some of the lower slopes, the loamy fine sand surface covering has a depth of 20 to 30 inches. North of St. Johns Church, the surface loamy fine sand has a depth ranging from 24 to 30 inches, and in an area about one-half mile west of St. James Church the loamy fine sand covering is 3 feet deep over the fine sandy clay in some places.

Included with Ruston fine sandy loam, hilly phase, are areas of Orangeburg fine sandy loam, hilly phase. These differ essentially from the Ruston soil in that the fine sandy clay subsoil is red.

The relief of Ruston fine sandy loam, hilly phase, is dominantly sloping, having a grade of from 6 to 20 percent, but includes also some knolls, hilly areas, and a few narrow winding ridges. Both sheet erosion and gully erosion are very noticeable on this soil. Drainage is good to excessive.

³ Percentages, respectively, of nitrogen, phosphoric acid, and potash.

⁴ TIDMORE, J. W. GRADES OF FERTILIZERS FOR CORN AND COTTON. A PROGRESS REPORT. Ala. Agr. Expt. Sta. Circ. 70, 12 pp. 1935.

Ruston fine sandy loam, hilly phase, is generally distributed throughout the county. The largest areas are around Arlington, northeast of Kimbrough, and around Snow Hill, and many scattered areas are in the central and southeastern parts.

Approximately 60 percent of Ruston fine sandy loam, hilly phase, has been cleared and cultivated, but perhaps less than 30 percent remains in cultivation. Some cleared land has eroded and has reverted to forest. Cotton is the principal crop grown on this soil and requires the same fertilizer treatments as when grown on the typical soil. The yields are generally lower than on typical Ruston fine sandy loam because the hilly phase is largely farmed by tenants and is more severely damaged by sheet and gully erosion. In the southeastern part of the county and south of Snow Hill, yields of cotton obtained on the hilly phase, where the soil has been fertilized with from 200 to 400 pounds of 3-8-3 or 4-8-4, are comparable to those obtained on typical Ruston fine sandy loam. In these localities many of the regular slopes have been terraced. Some corn, peanuts, and sorgo are grown. Peaches, pecans, and Scuppernong grapes do well on this soil. For the areas having a rougher relief, kudzu, which can be cut and fed to cattle, is recommended for prevention of erosion. Terracing and strip farming are recommended for holding this soil in its present position. Cover crops should also be grown during the winter to check erosion. Forestry is recommended for eroded and more hilly areas.

Orangeburg fine sandy loam.—Orangeburg fine sandy loam is closely associated with the Ruston and Red Bay soils. It differs from Ruston fine sandy loam in that its surface soil is browner and the subsoil is redder and slightly heavier; and it differs from the Red Bay soil in that its surface soil is grayish brown or brownish gray in contrast to the reddish-brown, brownish-red, or red surface soil of the Red Bay soils. The texture is generally lighter in both surface soil and subsoil in the Orangeburg than in the Red Bay fine sandy loam.

The surface soil to a depth ranging from 4 to 6 inches is brownish-gray or grayish-brown loamy fine sand or light fine sandy loam. The subsurface layer is yellowish-brown or reddish-brown mellow friable fine sandy loam to a depth ranging from 10 to 18 inches. The subsoil is red fine sandy clay or friable clay. The underlying parent material, which occurs at a depth ranging from 5 to 8 feet, is very variable. In the main it is underlain by interstratified mottled and streaked sands and clays.

This soil is not extensive, but small areas are well distributed throughout the county. The most typical areas of Orangeburg fine sandy loam are near Oakhill and Furman. One area northeast of Pebble Hill has a heavier subsoil than typical, and the surface soil is largely washed away, leaving much of the red subsoil exposed. By careful management, much of this area can be brought back into cultivation. This eroded area is best suited to the production of cotton, oats, and winter cover crops.

Approximately 85 or 90 percent of Orangeburg fine sandy loam is under cultivation and is used principally for the production of cotton. Under the present system of farming, yields of cotton are fair to good, ranging from one-third to two-thirds of a bale an

acre, depending on the amount and grade of fertilizer used, cultural practices, and weather conditions. The Alabama Agricultural Experiment Station, on the other hand, has been producing approximately 1 bale of cotton an acre on experimental fields when fertilized with 600 pounds of a 6-8-4 fertilizer. This soil is also good for the production of corn, where sheet erosion has not been active. The corn should be grown in rotation with cotton and fertilized with 150 to 225 pounds of nitrate of soda or its nitrogen equivalent. To produce corn economically on the eroded areas of this soil, large amounts of organic matter and mineral plant nutrients must be incorporated and the depth of the surface soil must be increased. Oats and winter cover crops are well adapted to this soil. More complete recommendations are given in the section on Land Uses and Agricultural Methods.

Red Bay fine sandy loam.—Red Bay fine sandy loam, locally known as "red land" or "red sandy land", is generally considered one of the best upland soils in the county, particularly for the production of cotton. The 6-inch surface soil is reddish-brown, brownish-red, or red fine sandy loam. Below the surface soil, or the plowed depth, is a 2- or 3-inch layer of dark brownish-red loam or clay loam. The subsoil, at a depth ranging from 8 to 50 inches, is dark-red friable sandy clay or friable clay, slightly sticky and somewhat plastic when wet. When exposed, this layer dries and bakes hard. It is important, therefore, for the farmer to take great precautions to prevent washing away of the surface soil. Below a depth of 50 or 60 inches the soil material becomes a little lighter in both color and texture. At a depth ranging from 5 to 15 or more feet most Red Bay soils are underlain by a reddish-yellow or yellowish-red layer of sand and rounded quartzite gravel ranging from a few inches to 1 foot or more in thickness. In some places this gravelly layer is replaced by a similar layer of reddish-yellow sand or loamy sand.

Included on the soil map with Red Bay fine sandy loam are areas of Akron fine sandy loam, Blakely loam, Orangeburg fine sandy loam, and a deep phase of the Red Bay soil, which are so small that separation is impracticable. Akron fine sandy loam differs from Red Bay fine sandy loam in having a somewhat compact and heavier subsoil. An area of this type of soil occurs at Dry Forks. Blakely loam has a surface soil of dark-brown loam and a subsoil of dark reddish-brown friable sandy clay. The two or three areas of Blakely loam occupy depressions within the Red Bay soil and are best suited to the production of corn or hay.

In a few areas, such as those northeast of Camden, the texture of the surface soil is considerably lighter than typical Red Bay fine sandy loam. This soil is a deep phase of Red Bay fine sandy loam and in places becomes loamy fine sand. Although not inherently so fertile as the typical soil, this soil can be built up to a state of fair productivity through the use of winter cover crops and mineral fertilizers. When thus improved it is better adapted to peanuts and corn and is more easily farmed than the typical soil.

The gravelly areas of Red Bay fine sandy loam are indicated on the map by gravel symbols. Such an area lies northeast of Reeves Chapel. Generally the surface soil is deeper in the gravelly

areas. The coarse material consisting of coarse gravel, small pebbles, and in some places small cobblestones may be spread over the surface or may be distributed evenly throughout the surface soil and subsoil. Even these gravelly areas are productive. The gravel or small cobblestones are seldom numerous enough to interfere greatly with cultivation.

Red Bay fine sandy loam is not distributed over the county, but occurs in a few fairly large bodies, principally north of Canton Bend, north and east of Holleys Ferry, and southwest of Blacks Bluff.

This is one of the most desirable farming soils in the county, because of its natural fertility, capacity to hold water, and response to fertilizers. Practically all of it is under cultivation. It is considered the best soil for cotton, which fruits abundantly in proportion to the size of the stalks; consequently most of the soil is used for the production of cotton. Where little or no fertilizer is used the yields range from one-third to one-half bale an acre, but when 300 to 600 pounds of a 6-8-4 mixture is used, the yields range from one-half to 1 bale or more an acre. This soil is also one of the best of the upland soils for the production of oats and other small grains and winter cover crops. Barnyard manure and liberal applications of lime are recommended in the preparation of the soil for alfalfa.

If protected from erosion, it is one of the easiest soils in the county to build up and maintain in a fair state of productivity. Preventive measures against sheet and gully erosion are especially important. A large part of this soil has undergone considerable sheet erosion, and as erosion progresses it becomes unsuited for corn. Terracing, deepening of the surface soil, and incorporation of large amounts of organic matter and mineral plant nutrients are necessary before corn can be produced profitably on such eroded areas.

In many places deep gulches are invading good fields of Red Bay fine sandy loam. These gulches, which in many places are as deep as 40 feet and may be 100 or more feet wide, are very difficult to control. Water rushes from fields into the gulches, undermines the surface by cutting out the underlying loose incoherent sands, and later causes sloughing off of the surface soil and subsoil. This invasion can be checked by diversion of the water to plank or concrete spillways while kudzu, honeysuckle, and other vines are being established around the heads of the gulches. After these plants are well established the gulch may be used again as a spillway without further damage. In other places this washing out is done by seepage water and intermittent springs at the base of the slopes. When the upper portion becomes saturated with water during heavy rains, it breaks off and drops, leaving a vertical wall. To control these areas it is necessary to prevent the loose material from being washed out at the base. This may be done by planting to kudzu, willow, grapes, or honeysuckle.

Red Bay fine sandy loam, hilly phase.—Red Bay fine sandy loam, hilly phase, differs from the typical soil mainly in relief and in lack of uniformity in texture and depth of the surface soil. The relief is sloping, with a grade of 6 to 20 percent, and in places it is hilly, broken, or deeply gullied. Uncleared areas have a surface soil and

subsoil similar to those of typical Red Bay fine sandy loam, but over the greater part of the cleared area sheet erosion has removed part, and in some places practically all, of the surface fine sandy loam covering.

Included in the mapping of Red Bay fine sandy loam, hilly phase, are small areas of Ruston fine sandy loam, hilly phase, and areas that have a dark-red, heavy, compact clay subsoil and that have been mapped in other counties of Alabama as Akron fine sandy loam, hilly phase. In Wilcox County these areas lie at a lower elevation, usually 50 to 60 feet lower, than typical Red Bay fine sandy loam, hilly phase. Some of them occur near the Butler County line.

The surface drainage of Red Bay fine sandy loam, hilly phase, is good to excessive, and the internal drainage is good. Terracing is necessary except on small areas at the bases of the slopes or the flat tops of some of the narrow ridges.

Red Bay fine sandy loam, hilly phase, is scattered over the county in close proximity to or adjoining Red Bay fine sandy loam. Approximately 60 percent of this soil has been cleared and formerly was cultivated, but precautions against erosion have not been taken. As a result much of it is badly eroded and gullied, and abandoned land is reverting to forest. Probably 30 percent of this soil is now cultivated. The same crops are grown as on typical Red Bay fine sandy loam, and the same amounts of fertilizer and the same cultural methods are used. Yields, however, are slightly lower because of less favorable moisture conditions. Cultivation on this hilly soil is more expensive than on the smoother areas of Red Bay fine sandy loam, because of the necessity of terracing to hold the surface soil. Areas of the hilly phase which cannot be economically terraced should be used for forestry or sodded to pasture grasses, such as Bermuda grass and lespedeza. Peaches and Scuppernong grapes do well on this soil.

Luverne fine sandy loam, mixed phase.—Luverne fine sandy loam, mixed phase, includes representative areas of Luverne fine sandy loam and small areas of Ruston fine sandy loam and of Susquehanna fine sandy loam. Luverne fine sandy loam has a 5-inch surface soil of brownish-gray or gray light fine sandy loam, grading into reddish-brown fine sandy loam. The subsoil is bright-red, very heavy, compact, tight, fine sandy clay, which, upon drying, cracks, checks, and forms small irregularly shaped fragments ranging in size from one-fourth to one-half inch. In most areas at a depth of about 24 inches the subsoil is reddish-yellow fine sandy clay, which is more friable than the layer above. This subsoil continues to a depth ranging from 4 to 5 feet where the texture may again become heavier. Small mica flakes are generally present in the lower part of the subsoil and in the underlying soil material.

Areas of Luverne fine sandy loam, mixed phase, lie in the western part of the county in the vicinities of Arlington and Pine Hill; other areas are in the northern part between Foster and Chilatchee Creeks and in the southeastern part near Caledonia.

Luverne fine sandy loam, mixed phase, occupies undulating, gently rolling ridge tops and a few gentle slopes, whereas the included areas of Ruston fine sandy loam occupy the crests of these ridges and those of Susquehanna fine sandy loam occupy the lower slopes. In a

few localities, especially near Rosebud, outcroppings of Ripley marl indicate some influence in the deep development of the surface soil and the red color, heavy texture, and compact structure of the subsoil.

Luverne fine sandy loam, mixed phase, is neither extensive nor agriculturally important. About 20 or 25 percent of this soil is under cultivation; other areas were formerly farmed; and the remainder is forested to shortleaf pine, scattered longleaf pine, and a growth of mixed hardwoods. The principal crop on this soil is cotton, which yields from one-fourth to one-half bale an acre under present farm practices. Better returns would be obtained if a 6-8-4 fertilizer were used, as discussed in the section on Land Uses and Agricultural Methods. This soil is also well adapted to oats and winter cover crops. Very little of it is in pasture.

The relief is undulating to gently rolling, and natural surface drainage is good. Because of the heavy character of the subsoil, both sheet erosion and gully erosion have been severe in many places. Crop yields decline in proportion to the amount of surface soil that has been removed by erosion. This soil is handled in much the same way as Susquehanna fine sandy loam. It is easier to till, as it dries earlier in the spring and has a little better subsoil drainage. The more gullied and rougher areas of Luverne fine sandy loam, mixed phase, should be devoted to forest.

Norfolk fine sandy loam.—Norfolk fine sandy loam is best developed in Wilcox County on the flat plateaus, northwest of Camden, and south of Dry Forks along McCall's Creek. The greater part of this soil in these localities is farmed. In cultivated fields the 5- or 7-inch surface layer is gray or grayish-yellow loamy fine sand, underlain by a subsurface layer, ranging from 8 to 10 inches in thickness, of grayish-yellow or pale-yellow light fine sandy loam. This material becomes heavier as it approaches the subsoil, which is yellow mellow friable fine sandy clay. At a depth ranging from 30 to 36 inches, mottlings of reddish brown appear, and the lower part of the subsoil is mottled yellow, reddish-brown, red, and gray fine sandy clay. It is slightly compact but brittle and readily crumbles into a fine mass under pressure. In some places the substratum material, at a depth of 5 or more feet, is rather heavy clay, resembling the material underlying Susquehanna fine sandy loam. A few areas contain a noticeable amount of small rounded quartz gravel in both surface soil and subsoil. The surface loamy fine sand is usually deeper than on typical areas elsewhere. Only a few small spots are sufficiently gravelly to interfere with cultivation, and in these areas the gravel range in size from one-fourth to more than 3 inches in diameter and are generally present only on the surface.

The largest areas of Norfolk fine sandy loam are in the vicinity of Camden. Several areas are west of Alabama River north and northwest of Clifton Ferry.

Norfolk fine sandy loam has an almost level, undulating, or gently sloping relief. Flatter and more uniform areas are developed on the plateaus, whereas more sloping areas and narrow ridges are developed in other parts of the county. Both surface and internal drainage are good. Sheet erosion is not prevalent on the smooth areas of Norfolk fine sandy loam, but the sloping areas are subject to erosion.

From 70 to 85 percent of Norfolk fine sandy loam is under cultivation, and the remainder is forested to old-field and longleaf pines or is idle. This soil is well adapted to all locally grown crops and lends itself to a diversified system of agriculture. It is used principally, however, for the production of cotton. Yields range from one-fourth to three-fourths of a bale an acre depending on cultural methods, fertilizer applied, and whether or not a preceding leguminous crop has been turned under. When fertilizers are applied as indicated in the section on Land Uses and Agricultural Methods, much larger yields are obtained. Corn yields range from 10 to 30 bushels an acre but are often more than doubled when corn follows a leguminous winter cover crop which has been turned under or when side-dressed with 225 pounds of nitrate of soda. Sugarcane yields from 75 to 250 gallons of sirup an acre and sorgo from 50 to 100 gallons an acre, depending on the season and the amount of fertilizer applied. The sirup produced from cane grown on Norfolk fine sandy loam has a better flavor and a brighter color than that produced on soils with brown or red subsoils. Cowpeas and velvetbeans give fair yields, especially when fertilized. Peanuts, sweetpotatoes, and garden vegetables are especially suited to this soil. Scuppernong grapes also do well.

Norfolk loamy sand.—Norfolk loamy sand in cultivated areas is light-gray or grayish-yellow loamy fine sand to a depth ranging from 5 to 8 inches. It is underlain by yellow or pale-yellow loamy sand, extending to a depth of 3 or more feet where it usually grades into fine sandy loam or fine sandy clay. In the southeastern part of the county, the loamy sand ranges in depth from 24 to 36 inches and is underlain by fine sandy clay. Included with Norfolk loamy sand are areas of Ruston loamy sand, which differs essentially from Norfolk loamy sand in that the surface soil is gray or brownish-gray loamy sand and is underlain by brownish-yellow or yellowish-brown loamy sand.

Norfolk loamy sand is fairly well distributed over the county, but the greater proportion is in the northern part. The largest areas lie along Foster Creek southeast of Alberta, and other areas lie northwest of Alberta. Scattered areas are in the southeastern part and in the central part around St. James Church.

This soil has an almost level, undulating, or gently rolling relief and is everywhere naturally well drained.

Approximately one-half of Norfolk loamy sand is under cultivation, and the remainder is idle or is grown up to old-field pine and scrub oaks. The main crop is cotton, and the yields are in proportion to the amount of fertilizer applied. With a liberal application of fertilizer or by turning under a green leguminous crop, fair yields of cotton can be obtained. Some corn is grown, and, with the incorporation of organic matter and the application of commercial fertilizers, fair yields can be had. This soil is well suited to growing peanuts and sweetpotatoes. Some soybeans and cowpeas are grown. A few areas are devoted to pasture, and the grasses consist of Bermuda and lespedeza.

Norfolk fine sandy loam, poorly drained phase.—Norfolk fine sandy loam, poorly drained phase, includes two phases of Norfolk fine sandy loam, the poorly drained phase and the heavy-subsoil

phase, so intricately associated that a practical separation was not possible. This soil lies at the bases of higher hills or long gentle slopes and usually occupies more or less fan-shaped areas. The flatter part is poorly drained, and the outer borders, where the drainage is usually good, have developed a heavy subsoil. The poorly drained soil predominates.

In the poorly drained phase, the 4- to 6-inch surface layer is dark-gray loamy fine sand. In the virgin state it may appear black when wet, but dries out light gray, shaded to dark gray by the organic content. From 6 to 10 inches below the surface is a yellowish-gray layer of loamy sand somewhat splotched with shades of light and dark gray. The subsoil continues to a depth ranging from 30 to 36 inches and is grayish-yellow fine sandy loam to light fine sandy clay mottled with rusty brown and shades of gray. When saturated with water, this land becomes very loose and boggy. It is therefore locally known as "rotten land." Below a depth of 36 inches, it has a tendency to become heavier and more compact but continues mottled.

The heavy-subsoil phase has a surface soil similar to that of the poorly drained phase but may be yellower. These two phases differ mainly in the subsoil. The upper part of the subsoil of the heavy-subsoil phase is pale-yellow light fine sandy clay, which grades into bright-yellow heavy somewhat plastic fine sandy clay at a depth of 20 inches. Below a depth of 36 inches it may be mottled with rusty brown, red, and yellowish gray.

Norfolk fine sandy loam, poorly drained phase, lies east of Camden along the highway to Estelle, south of Reeves Chapel, and elsewhere.

Approximately 15 percent of this soil is cultivated, and the principal crops are corn and sorgo. A large part is used as woodland pasture, in which carpet grass, Bermuda grass, native grasses, lespediza, and underbrush predominate. Quail food, such as gallberries, blackberries, and partridge-peas grow on it, and sesbania and benne may be grown. The forest growth consists of sweetgum, black gum, post oak, elm, other hardwoods, and old-field pine.

Susquehanna fine sandy loam.—The surface soil of Susquehanna fine sandy loam, to a depth ranging from 4 to 6 inches, is gray or grayish-yellow fine sandy loam. The subsurface layer continues to 10 or 15 inches below the surface. It is pale-yellow or yellowish-gray fine sandy loam and becomes heavier with depth. The subsoil is heavy stiff clay, very plastic when wet. The upper part appears yellowish red but is mottled with fine specks of yellow and red. Below this is mottled red, yellow, and gray very plastic clay. The gray increases with depth, and at a depth ranging from 18 to 20 inches, it is mottled gray, yellow, and red plastic clay. Below a depth of 4 feet the material may grade into more friable micaceous clay, bluish clay, or unweathered shalelike material.

Gravelly areas of this type are indicated by gravel symbols on the map. The gravel is not uniform in depth; in some places it is a thin surface covering, and in a few places it extends down into the clay of the subsoil. In most places it tends to form a deeper, more open and friable surface soil than the typical soil. The subsoil is usually free from gravel and is similar to the typical subsoil.

Susquehanna fine sandy loam occupies undulating ridge tops and gentle slopes. In mapping, small areas of Ruston fine sandy loam, especially on small ridge tops or near the bases of gentle slopes, where the accumulated sandy material is deeper; areas of Norfolk fine sandy loam; and areas of other types of Susquehanna soils too small to separate are included.

As this soil occurs on gentle slopes and its subsoil is heavy, plastic, and practically impervious, it is very subject to sheet and gully erosion. A cover of grass or forest should be kept on the sloping areas.

The largest areas of Susquehanna fine sandy loam lie west of Alabama River in the vicinity of Lower Peach Tree and northwest of Pine Hill. Smaller areas are developed in the central part northwest and east of Camden and in the southeastern part in the vicinity of Pine Apple.

From 35 to 50 percent of Susquehanna fine sandy loam is under cultivation, principally to cotton, but corn and other minor crops are produced, principally in the small depressions and areas having good deep surface soils. Susquehanna fine sandy loam is tilled mainly by tenant farmers. Cotton yields are generally low, particularly on the eroded areas. Ordinarily yields of cotton range from one-fourth to one-third of a bale an acre, but higher yields are obtained in seasons of normal to heavy rainfall where green-manure crops or large applications of commercial fertilizers are used.

Susquehanna fine sandy loam produces good timber. Shortleaf pine, longleaf pine, and some hardwoods make a fast growth. All of this soil, except the areas having the smooth relief and the deeper covering of original soil, should be devoted to forest.

Susquehanna very fine sandy loam.—Susquehanna very fine sandy loam differs from the fine sandy loam principally in its uniformly fine surface texture and in the position it occupies. The 7- or 8-inch surface soil of the cultivated areas is ash-gray loamy very fine sand or light very fine sandy loam and has a high content of silt. It has a powdery feel when passed through the fingers. The lower part of the surface layer shows faint mottlings of light grayish yellow and rusty brown. Below this layer is a thin transitional layer, 2 or 3 inches thick, grading from grayish-yellow very fine sandy loam to yellowish-brown very fine sandy clay. The subsoil is 10 or 12 inches below the surface. It is dark yellowish-red or reddish-brown plastic heavy very fine sandy clay or clay containing a considerable amount of very fine sand or silt and finely mottled with red, yellowish red, and creamy gray. With depth, the red is replaced by gray, and, at a depth ranging from 30 to 36 inches, the subsoil is gray or olive-gray plastic clay, mottled with small specks of red, brown, and yellowish brown.

As mapped, small areas of Susquehanna clay and gradations between the very fine sandy loam and the clay types of Susquehanna are included. In some areas, the clay subsoil rests on a layer of buhrstone at a depth of less than 3 feet below the surface, and in a very few places the loamy very fine sand extends to the buhrstone at a depth ranging from 16 to 20 inches. In these spots the heavy clay appears just below the thin layer of soft buhrstone. The

largest area of this variation from the typical soil is 1½ miles west of McWilliams and one-half mile north of the Monroe County line. It is cultivated, and crops are reported to suffer less during dry spells than crops on the typical very fine sandy loam.

In cultivated fields, the surface soil of Susquehanna very fine sandy loam varies considerably in depth. Many of the fields have a spotted appearance because of the exposure of red subsoil where erosion has removed the gray surface soil. Erosion is very active over the soil, even on the gentle slopes. The surface soil lies so loosely over the heavy subsoil that any washing will remove practically all of the surface covering and will expose the heavy clay. Such areas have only a fraction of the original value.

Practically the entire area of Susquehanna very fine sandy loam lies east of Watsons Crossing north of the Monroe County line. It is located on gently undulating to undulating ridge tops, underlain at various depths by a layer of buhrstone. Drainage water has cut through the buhrstone in places and carved deep V-shaped gullies with steep slopes extending up into the flatter areas.

About 40 percent of this soil is under cultivation, principally to cotton, but corn, sugarcane, and other farm crops and vegetables are grown. Under present cultural methods, yields are about the same as on Susquehanna fine sandy loam. The remainder is principally in forest and range-land pasture supporting carpet grass and under-brush. Forested areas support an excellent stand of young longleaf pine and a mixture of shortleaf pine and hardwoods.

Amite fine sandy loam.—Amite fine sandy loam corresponds in color, texture, and structure to Red Bay fine sandy loam of the uplands, but is less subject to erosion than the Red Bay soils. The surface soil of Amite fine sandy loam, to a depth ranging from 6 to 8 inches, is brown fine sandy loam or loamy fine sand, underlain by a 3- to 6-inch layer of reddish-brown heavy fine sandy loam. The subsoil is reddish-brown to dark-red friable fine sandy clay which is slightly sticky when wet. It continues to a depth ranging from 40 to 60 or more inches, where it becomes lighter in color and texture, and at a depth ranging from 6 to 10 feet, brownish-yellow loamy fine sand, containing in some places rounded quartz gravel, is present. This layer of loose material gives good aeration and sub-drainage to the surface soil and subsoil.

Amite fine sandy loam occupies a terrace position along Alabama River and has an almost level or gently undulating relief which is favorable for agricultural purposes. The main areas lie southwest of Blacks Bluff, and 2 miles west of Holleys Ferry.

About 95 percent of this soil is cultivated, principally to cotton. The soil is well adapted to all locally grown crops and responds to good management. Yields compare favorably with those obtained on Red Bay fine sandy loam of the uplands. The yields of cotton range from one-third to more than two-thirds of a bale an acre, depending on seasonal conditions, cultural methods, and amount of fertilizer applied. Usually 250 to 300 pounds of 4-8-4 or 3-8-3 are used. The application of 600 pounds of 6-8-4, as recommended by the agricultural experiment station, would in all probability increase the yield to 1 bale or more an acre. The yields of corn range from 10 to 20 bushels an acre without fertilizer, but yields of 35

to 45 bushels should be obtained following the turning under of a leguminous winter cover crop or when the corn is fertilized with 225 pounds of nitrate of soda. Other crops do proportionately well. (See section on Land Uses and Agricultural Methods for further fertilizer recommendations.)

Cahaba fine sandy loam.—Cahaba fine sandy loam resembles Ruston fine sandy loam of the uplands in color, texture, and structure, but is distinguished from the Ruston soil because of its lower, or terrace, position. The 6-inch surface soil is brownish-gray loamy fine sand, underlain by brownish-yellow loamy sand or light fine sandy loam, extending to a depth of 12 to 16 inches. The subsoil is yellowish-brown or slightly reddish brown fine sandy clay which is, for the most part, friable but in some places becomes more compact and slightly sticky when wet. The subsoil extends to a depth of from 30 to 60 inches and is rather uniform in color. The deeper subsoil is on the higher river terraces. In typical Cahaba fine sandy loam, both the color and the texture tend to become lighter with depth. In places where the underlying soil material is heavier, the color becomes mottled with shades of yellow, yellowish brown, and red in the lower part of the subsoil, but in the more typical areas no mottlings appear in the upper 3 feet. In some locations on the river terraces, a reddish-yellow loamy sand or sand layer is present from 70 to 90 inches below the surface and allows excellent underdrainage.

As mapped, Cahaba fine sandy loam includes small areas of Amite fine sandy loam, Kalmia fine sandy loam, and Kalmia very fine sandy loam, too small to be separated. In addition, a few small areas are included that have a bright-red lower subsoil layer and have been mapped as Chattahoochee fine sandy loam in counties where the soil is abundant enough to stand as a type. The areas included have practically the same economic value and cultural characteristics as Cahaba fine sandy loam.

Cahaba fine sandy loam is fairly well distributed throughout the county on the terraces of Alabama River and the larger creeks, but the main bodies are chiefly on the river terraces, in the large bends north and west of Camden and west of Blacks Bluff.

About 90 percent of the land is under cultivation. It is well adapted to all locally grown crops, but approximately 80 percent of the cultivated area is in cotton, and most of the remainder in corn or corn and interplanted leguminous crops. Cotton yields are about the same as on Ruston fine sandy loam, and the same fertilizers and cultural methods are recommended. The corn yields are usually a little higher because this soil has suffered less from erosion and has more favorable moisture conditions. Fertilizers are seldom used in the production of corn and other crops. Yields of sorgo, sugar-cane, beans, peas, and other farm crops are equal to or better than those on Ruston fine sandy loam.

Cahaba loamy fine sand.—Cahaba loamy fine sand is developed on the second bottoms, or terraces, along Alabama River and the larger creeks. It is light-brown, brown, or yellowish-brown loamy fine sand to a depth of 3 or more feet. No abrupt change occurs in color or texture from the surface soil to the subsoil, but the intensity of red increases with depth. In places at a depth ranging from 3 to 3½ feet the subsoil becomes fine sandy loam, but generally the loamy

fine sand continues to a depth of several feet and gradually becomes lighter both in texture and color. Included with Cahaba loamy fine sand are small areas of *Kalmia* loamy fine sand.

Cahaba loamy fine sand is scattered throughout the lower terraces along Alabama River, and a few small areas occur along some of the larger creeks. On the river terraces, it occupies broad flat ridgelike areas, slightly higher than the surrounding soils, whereas along the creeks the areas are narrow and have a benchlike position.

About 50 percent of the land is cultivated. The remainder, most of which was once in cultivation, is now either in pasture or supports second-growth forest, dominantly old-field pine and longleaf pine.

Because of its sandy texture and open structure, this soil can be worked earlier in the spring and sooner after rains without injury to the soil or crops than the fine sandy loams. About one-half of the cultivated area is in cotton, and the remainder is in corn, peas, peanuts, sorgo, sweetpotatoes, and watermelons.

This soil is naturally lower in the mineral plant nutrients than Cahaba fine sandy loam, and those present are subject to leaching from year to year. Successful management of Cahaba loamy fine sand therefore requires the annual incorporation of organic matter and mineral plant nutrients. Turning under of green-manure crops not only temporarily increases the organic content but also improves the capacity of the soil to hold moisture. Without commercial fertilizers the yields are low but by turning under leguminous crops or by applying a liberal amount of high-grade fertilizer, fair to good yields of the afore-mentioned crops may be obtained. This soil is particularly well suited to the production of peanuts, watermelons, and early vegetables.

Wickham fine sandy loam.—The 6- or 8-inch surface soil of Wickham fine sandy loam is grayish-brown or brown loamy fine sand or light fine sandy loam. This changes rather abruptly into yellowish-brown or reddish-brown rather heavy but brittle very fine sandy clay or clay, 4 or more feet in depth. This material is usually underlain by lighter colored and lighter textured material. Some finely divided mica scales are present in the surface soil, in the subsoil, and even in the underlying material. In the subsoil faint mottlings of red, rust brown, and shades of gray and yellow are present in some places at a depth ranging from 15 to 20 inches.

Included with this soil are areas of Cahaba fine sandy loam and Augusta silt loam, so small that separation on the map is impracticable. South of McCalls Creek are a few areas where the surface soil is loamy very fine sand or very fine sandy loam and the subsoil is very fine sandy clay, which is more friable than the subsoil under typical Wickham fine sandy loam.

Wickham fine sandy loam occupies the narrow crests of low ridges on second bottoms or lower terraces along Alabama River. These areas are separated by shallow swales or wider, flat, poorly drained areas of other soils. Bordering these wetter areas the subsoil of Wickham fine sandy loam shows considerable mottling. Most of this soil lies north of Millers Ferry, southwest of Clifton Ferry, and in other places along the river. All of this soil is naturally well drained and has favorable relief for agricultural purposes.

Approximately 70 percent of Wickham fine sandy loam is culti-

vated. Cotton is the principal crop, and the yields range from one-third to two-thirds bale an acre. The usual fertilizer is about 250 to 300 pounds of 3-8-3 or 4-8-4, but applications of 400 to 600 pounds of 6-8-4 fertilizer should be more economical. This soil is well suited to the production of oats, which should be given an application of 100 to 150 pounds of nitrate of soda in the spring. Only a small amount of this soil is used for growing corn, the yields of which are generally low. Fertilizer recommendations are included in the section on Land Uses and Agricultural Methods.

Wickham silt loam.—The surface soil of Wickham silt loam is dark-brown or yellowish-brown heavy silt loam to a depth ranging from 4 to 7 inches. The subsoil, which extends to a depth of about 18 inches, is yellowish-red or reddish-brown, heavy, slightly compact; brittle silty clay or clay. This grades into mottled reddish-brown, red, and grayish-yellow slightly compact brittle clay or silty clay. This material extends to a depth of 6 or more feet with little change in texture or structure, but the gray increases with depth.

Included on the map with Wickham silt loam are a few small areas of Wickham fine sandy loam and Augusta silt loam.

Only about 20 to 30 percent of Wickham silt loam is cultivated. Greater care is required in preparation of the seedbed and in cultivation of the crop on this soil than on Wickham fine sandy loam, for the soil breaks into hard lumps if plowed when too dry and it puddles if plowed when wet.

This soil lies on low swells that rise from a few feet to approximately 10 feet above the surrounding lowland. These swells or ridges are the second bottoms, or low terraces, and they range in width from a few hundred feet to a quarter of a mile. The main areas of this soil are 3 miles northeast of Ellis Ferry, 2½ miles south of Asahel, and 1½ miles east of Lower Peach Tree Ferry, and small areas occur north and northeast of Millers Ferry. Areas north of Ellis Ferry occur on the second bottoms and have a deeper surface soil and a more friable subsoil than typical Wickham fine sandy loam.

Wickham silt loam is used for the growing of cotton and corn and for pasture. Yields of cotton during favorable years range from one-fourth to one-half bale an acre without the use of fertilizers. Boll weevil damage is severe during wet seasons because of the late maturity of the cotton and the large vegetative growth of the stalks. Corn yields range from 15 to 25 bushels without fertilizer. Wickham silt loam is a better soil for corn and grass than Wickham fine sandy loam, and these two crops and oats are the best for this soil. The principal pasture grasses are carpet grass, Dallis grass, and lespedeza.

Kalmia fine sandy loam.—Kalmia fine sandy loam differs from Norfolk fine sandy loam chiefly in that it occupies a lower position and is developed on stream terraces. It is a younger soil and generally has a paler color throughout the surface soil and subsoil.

The 4- to 6-inch surface soil is gray fine sandy loam, which, because of its content of organic matter, appears somewhat dark when moist. This layer is very mellow and friable. The subsurface layer extends to a depth of about 14 inches below the surface and is pale-yellow mellow friable fine sandy loam. Its texture becomes slightly heavier with depth. The subsoil extends to a depth ranging from 30

to 36 inches. It is pale-yellow or yellow friable fine sandy clay showing some faint mottlings of gray or brown in the lower part. A stratified gray, yellow, and brown fine sandy loam material generally underlies the subsoil.

About 75 percent of *Kalmia* fine sandy loam is cultivated. It occurs on the second bottoms, or terraces, along Alabama River, along several of the larger creeks, and along some of the smaller drainageways. The relief of this soil is generally flat, but along the creeks and smaller drainageways it occupies small irregularly shaped benchlike positions.

Where *Kalmia* fine sandy loam constitutes only a small proportion of the farm, it is generally planted to corn, sugarcane, and sorgo, but where it constitutes a large proportion, cotton is the principal crop grown. Cotton is generally fertilized with from 250 to 300 pounds of 3-8-3 or 4-8-4. In good years, the cotton yield is about the same as on *Norfolk* fine sandy loam, but, because of the lower position of *Kalmia* fine sandy loam, late frosts or cold spring weather may injure cotton or retard its growth and cause the crop to be smaller or later than on *Norfolk* fine sandy loam.

Because of more favorable moisture conditions, *Kalmia* fine sandy loam is a slightly better soil for corn than *Norfolk* fine sandy loam. Fair yields of sugarcane and sorgo are obtained, and a good quality of sirup is produced. Sweetpotatoes do well on the higher areas. Some of the land is used for pasture, especially where seeded to carpet grass and lespedeza.

The soil is easy to till and responds to commercial fertilizers and to the addition of any form of organic matter. Uncultivated areas of this soil support a growth of old-field pine and pasture grasses.

***Kalmia* loamy fine sand.**—*Kalmia* loamy fine sand differs from *Kalmia* fine sandy loam in having a lighter texture throughout the surface soil and subsoil, and its subsoil is slightly paler yellow. The surface soil is gray or yellowish-gray loose friable loamy fine sand to a depth of 10 to 14 inches. No definite change in texture occurs from the surface soil to the subsoil, but the color changes gradually to pale grayish yellow. The lower subsoil layer generally becomes somewhat heavier and grades into light fine sandy loam or light sandy loam at a depth of about 30 inches but may continue a loamy fine sand below a depth of 3 feet.

This soil is mapped on the river terraces and along the larger creeks throughout the county, but nearly half is located on the terraces along Chilatchee Creek and its tributaries, especially northwest and south of Alberta. About 60 percent is under cultivation.

This soil is not so productive as *Kalmia* fine sandy loam but when heavily fertilized produces fair yields of the same crops as those grown on the latter soil. *Kalmia* loamy fine sand is deficient in organic matter and mineral plant nutrients. Where there is a market for vegetables, this soil is often selected for the production of early truck crops. In years of well-distributed rainfall, good yields of ordinary field crops are usually obtained on well-managed land, but dry spells will retard the growth of crops planted on it more than that of crops planted on heavier soil. Most of the uncultivated areas of this soil are in pastures of carpet grass, Bermuda grass, lespedeza, or broomsedge. The remainder supports a second growth of shortleaf pine saplings. The soil is best suited to forestry.

Kalmia very fine sandy loam.—Kalmia very fine sandy loam differs from Kalmia fine sandy loam principally in having a high content of very fine sand throughout the surface soil and subsoil. Because of poorer drainage, this soil does not warm so early as Kalmia fine sandy loam. It is located mainly southwest of Coy on the Alabama River terrace. It occupies low ridges, some of which are very narrow whereas others are a quarter of a mile or more wide. These low ridges are separated by shallow, dished drainageways with frequent wide slight depressions extending into the better drained Kalmia soil.

The surface soil to a depth ranging from 4 to 6 inches is gray loamy very fine sand or very fine sandy loam. In cultivated areas, the surface layer is ash gray. The subsurface layer to a depth ranging from 10 to 12 inches is yellowish-gray very fine sandy loam. To a depth of 20 inches the subsoil is yellow friable very fine sandy clay, and in the better drained areas it extends to a depth of 30 inches. Below 20 or 30 inches the subsoil material becomes slightly compact, brittle very fine sandy clay, mottled with rusty brown, bright red, burnt orange, and yellowish gray. At greater depths the gray increases and takes on a blue cast, and the material becomes plastic. In places small rounded quartz gravel or iron accretions are found on the surface and in the upper part of the subsoil. As mapped, this soil includes small areas of Cahaba fine sandy loam, Kalmia fine sandy loam, and Myatt fine sandy loam.

Only about 20 percent of Kalmia very fine sandy loam is under cultivation. The rest is cut-over land covered with a scattered growth of longleaf and shortleaf pines and some hardwoods. A few small areas demonstrate that it is capable of supporting a dense growth of pines. Cotton, corn, sorgo, and sugarcane are the principal crops produced. In favorable seasons the cotton yield is about the same as on Norfolk fine sandy loam, but in wet seasons it is very much lower. Corn, sugarcane, sorgo, and other minor crops do fairly well and are generally grown without the addition of fertilizers or with only light applications of a complete fertilizer. The sirups are of a good quality. This soil is well adapted to carpet grass, Dallis grass, and lespedeza, making it good for pasture.

Kalmia very fine sandy loam, poorly drained phase.—Kalmia very fine sandy loam, poorly drained phase, differs from the typical soil in its flatter relief and poorer drainage. Under natural drainage conditions, the soil warms and dries more slowly. The surface soil to a depth of 5 or 6 inches is dark-gray very fine sandy loam, underlain to a depth of 10 to 14 inches by yellowish-gray very fine sandy loam mottled with gray and grayish yellow. The subsoil is pale yellowish-gray friable very fine sandy clay mottled with rusty brown, yellow, and gray. This extends to a depth of 20 to 24 inches. The lower part of the subsoil becomes slightly compact in places but is friable and crumbles easily when broken loose. In places, specks of red or reddish brown appear in the lower part of the subsoil.

This soil occurs in many parts of the county but chiefly in one large area about 3 miles west of Camden. Artificial drainage makes it possible to cultivate a larger proportion of this particular area than of the typical soil. Under natural drainage conditions, this phase is used chiefly for pasture and supports a good growth of carpet

grass and lespedeza, but unless care is taken, broomsedge and coarse weeds interfere with the growth of the better grasses. Cotton, corn, sorgo, and sugarcane are the principal crops grown on the drained areas. This soil is not well adapted to cotton, and yields are low and uncertain. It is best adapted to corn, sorgo, and sugarcane. The latter crops and other minor crops are usually grown without fertilizers. Much of this soil could best be used for pasture supporting a good growth of lespedeza and carpet grass.

Leaf fine sandy loam.—Leaf fine sandy loam has a 6-inch surface soil of gray fine sandy loam. At a depth ranging from 6 to 18 inches, it grades into yellowish-gray, grayish-yellow, or yellow fine sandy clay, friable in the upper part and becoming somewhat plastic in the lower part. The subsoil is gray plastic fine sandy clay, mottled with yellow, red, and reddish brown. When moderately dry, it is rather stiff. Below a depth of 3 feet the material consists of heavy plastic clay, mottled bluish gray, rusty brown, and bright yellow, and contains more or less fine sand. Variations in texture, structure, and degree of plasticity occur, depending on the sources of the soil material. The color of the subsoil depends on the drainage conditions, the brighter colors occurring in the better drained portions.

Included with Leaf fine sandy loam are several areas south of Coy and southwest of Asahel that have a finer textured surface soil but do not have such a plastic subsoil. Agriculturally, these are slightly better soils, because the more open subsoil affords better aeration and underdrainage.

Leaf fine sandy loam is developed on the second bottoms, or terraces, and has flat to undulating relief. It is well distributed throughout the county along the larger creeks, especially along the creeks passing through the Susquehanna soils and the heavy noncalcareous soils of the clay uplands.

Natural drainage is inadequate because of the prevailing flat relief and the heavy character of the subsoil. Open ditches are necessary in places to carry off excess rain water.

About 40 percent of this soil is cultivated; 50 percent is in pasture, largely cleared, supporting a good growth of carpet grass, lespedeza, broomsedge, and other grasses; and the remainder is in forest of shortleaf pine, sweetgum, and mixed hardwoods.

Cotton is the principal crop, and yields range from one-fourth to two-fifths of a bale an acre. Corn yields range from 8 to 20 bushels and average 12 bushels. Some sorgo, soybeans, and cowpeas are grown. This soil is not so well adapted to cotton as Susquehanna fine sandy loam because it warms more slowly, but it is a better soil for corn because of more favorable moisture conditions. Yields depend on the season and the cultural methods. Fertilizers, except small applications on cotton, are seldom used.

Ochlockonee fine sandy loam.—Ochlockonee fine sandy loam is developed in the first bottoms along the streams in practically every part of the county. It has nearly flat to gently undulating relief. The largest continuous areas are along Turkey Creek and the upper part of Pine Barren Creek in the eastern and southeastern parts of the county, and several large areas are along Alabama River and along several creeks in the southwestern part. Small areas of Congaree fine sandy loam along Alabama River are included with this

soil in mapping, because the total area of the Congaree soil is too small to warrant separation on the map.

The surface soil of Ochlockonee fine sandy loam varies in texture from light fine sandy loam to heavy fine sandy loam and in color from brownish gray or yellowish brown to dark brown. It is usually 8 to 12 or more inches deep. The subsoil is yellowish-brown or brown loam or friable fine sandy clay to a depth of 20 or 30 inches. Below this is mottled light-gray and brown loam or fine sandy clay. In some of the poorer drained areas mottlings are present throughout the subsoil. As this is a first-bottom soil, new material may be added by each overflow, and the profile is therefore not uniform in color or texture.

Of this soil, 20 percent is under cultivation, 70 percent in pasture, and 10 percent in timber. Corn, hay, sugarcane, and sorgo are the principal crops. In certain parts of the county, especially in the southeastern part along upper Pine Barren Creek and Turkey Creek, a considerable acreage is planted to cotton. This soil type is not recommended for cotton, but, in favorable years, yields of one-half bale or more an acre are obtained with very little or no fertilizer. Except when overflows occur during the summer and early fall, corn yields are usually very satisfactory, ranging from 20 to 40 bushels an acre without fertilization.

The soil contains a fair amount of organic matter which, together with favorable moisture conditions and good physical characteristics, renders it good for the production of corn, forage crops, and pasture grasses.

Because crops are subject to destruction by overflows, most of this soil is in cleared pasture and in woodland pasture. This appears to be the best and safest use under present conditions. The soil produces good pasture of carpet grass, lespedeza, Bermuda, and some clovers. The poorer drained areas are best suited to forests of water-loving hardwoods and to some shortleaf pine.

HEAVY SOILS OF THE UPLANDS AND PRAIRIES

The heavy soils of the uplands and prairies occur in the east-central, northeastern, and northwestern parts of the county, or in what is known as the "black belt." They occupy 14.9 percent of the area of the county. In this group of soils are included both soils developed under prairie and those formed under part prairie and part forest. In the prairie, or limy, division are Sumter clay; Sumter clay, mixed phase; Sumter clay loam, black-surface phase; and Bell clay; and in the noncalcareous division are Oktibbeha fine sandy loam; Oktibbeha clay; Wilcox clay; Lufkin clay; Lufkin clay, mixed phase; Vaiden fine sandy loam; Lufkin clay loam, and Catalpa clay.

Practically all these soils are markedly different in color, texture, and structure from the soils of the sandy uplands and river terraces. They occupy nearly flat to gently rolling plateau areas and usually lie 25 to 50 feet below the general level of the sandy uplands. The Sumter and Bell soils are developed under prairie grasses. They are calcareous throughout and are underlain mainly by white siliceous limestone and in places by Ripley marl, which is high in calcium carbonate. Outcrops of the limy material are common throughout

the area of the Sumter soils. The limy material also underlies the Oktibbeha soils at a depth of from 2 to 5 feet and the Vaiden at somewhat lower depths, whereas the Ripley marl underlies a part of Wilcox clay. The Wilcox, Vaiden, Oktibbeha, and Lufkin soils are underlain by beds of heavy clay which in many places are superimposed upon the limy material.

These soils, except Oktibbeha and Vaiden fine sandy loams, are characterized by heavy, waxy, impervious clay surface soils and subsoils. When wet, these clay surface soils and subsoils are very plastic and sticky, and when dry they are hard and intractable and crack and shrink badly. Plowing and cultivating under proper moisture conditions crumble the surface soil into coarse angular particles about the size of buckshot. Most of these soils have fair to good natural surface drainage, but because of the impervious character of both surface soil and subsoil, internal drainage is extremely slow. The Oktibbeha soils are the best oxidized and reddest soils in this group, whereas Lufkin clay is the heaviest and least oxidized and aerated.

Cotton is the principal crop grown on the Vaiden, Wilcox, Oktibbeha, and Lufkin soils, but practically none is produced on the Sumter soils. Bell clay is the best soil in this group for the production of corn, and the Sumter and Catalpa soils are devoted to the production of hay, corn, and pasture. The raising of livestock is the chief source of income on the prairies.

Sumter clay.—Sumter clay, locally known as "gray prairie" or "lime land", is derived from Ripley marl. This marl carries various amounts of very fine sand or silt. The Sumter soil in this area, therefore, differs somewhat from the Sumter soils of other counties in Alabama in that it carries more fine sand and silt and is somewhat more friable.

The surface soil of this type is variable in color, ranging from brownish dark gray to almost white, especially in the eroded areas. The darker spots range in depth from 2 to 7 inches. In most of this type, however, the lighter colors prevail. It is sticky and plastic when wet and is friable and crumbly when dry. It breaks into a granular structure even when plowed under saturated conditions. The subsoil, to a depth ranging from 6 to 15 inches, is a grayish-yellow to almost white clay mottled with bright yellow and containing some soft white lime concretions. Below this is a mottled yellow-gray and white clay containing some silt and very fine sand. This extends to a depth ranging from 3 to 5 feet to the partly weathered marl. It is friable throughout. In many places are layers of indurated or hardened gray limy material, mottled with yellow and brownish yellow, which are from 3 to 6 inches thick. They may occur at any depth and at intervals of from 12 to 15 or more inches. When exposed, these layers become very hard. They often form ledges on the slopes, and fragments of this rock are scattered over the surface in many places. They range in size from 1 to 12 or more inches. In some places they are so numerous that they interfere with cultivation.

Several variations from the typical soil are included with this soil on the map. Small areas of Oktibbeha clay or a shallow phase of that soil, which has no apparent relation to the relief, occur here

and there. The surface soils of these patches are yellowish-red or brownish-red clay. Where Oktibbeha clay occupies 20 to 40 or more percent of the area it is shown on the soil map as Sumter clay, mixed phase. On some of the flat areas or in depressions Sumter clay is darker than the typical soil and resembles Houston clay, a Prairie soil with a dark-gray to black surface soil, but is much more friable than Houston clay. Included with Sumter clay are a few small areas near Starling Church south of Furman that are derived from a highly siliceous marl. These areas have a very shallow grayish-white covering. They resemble Sumter clay loam in texture but differ from that soil in color and depth of surface soil.

The greater part of Sumter clay occupies gently sloping surfaces. Rain water runs off rapidly on account of the heavy character of the soil material and causes serious washing of the surface soil. In many places gullies have been formed, and in a few spots the soil has been entirely removed. Such areas cannot be economically reclaimed. Erosion is not serious on areas sodded to grasses but is especially damaging on cultivated fields that are not protected by well-constructed terraces.

The largest areas of this soil are southeast of Darlington, east of Allenton, and north and east of Furman. Probably less than 1 percent of the land is now used for cotton. Most of the soil is in pasture. From 2 to 5 percent is used for Johnson grass hay, corn, sorgo, alfalfa, and oats. This soil is primarily a grass soil. Wild grasses and many kinds of clovers are native to it, and most of the land is well sodded with Bermuda grass, Dallis grass, *Melilotus*, black medic, hop clover, and other clovers. Primrose, dandelion, and several other flowering weeds are conspicuous. Because of its suitability for pasture and hay crops, Sumter clay offers excellent opportunities for dairying and for raising cattle and sheep.

Sumter clay, mixed phase.—Sumter clay, mixed phase, locally known as "mixed prairie", includes small areas of Sumter clay and Oktibbeha clay, so intricately mixed that their separation is impracticable. Sumter clay usually predominates. Throughout the mixed phase the plowed fields have a spotted appearance ranging from the light gray of the eroded Sumter clay to the red of the eroded Oktibbeha clay. As mapped, a few small areas of gradations between Sumter clay and Houston clay, a dark-surfaced Prairie soil with a heavy plastic subsoil, are included.

Sumter clay, mixed phase, is scattered generally throughout the prairie section, with the greatest acreage in the eastern part of the county.

Cultural methods used on this phase are governed largely by local conditions and the extent to which one soil predominates over the other. In the wooded areas the Oktibbeha soils are forested by shortleaf pine and scattered hardwoods, whereas the Sumter soils are covered with grasses. The greater part of this mixed phase is under cultivation or is used for pasture and hay. Cotton is the chief crop grown, though corn, hay, and sorgo are grown in the lower positions. It is a fair soil for the production of Johnson grass, but the best use for it is for pasture to prevent further erosion.

Sumter clay loam, black-surface phase.—Sumter clay loam, black-surface phase, differs from Sumter clay in the texture and color of the surface soil and in the texture of the subsoil. The surface soil, which ranges from 4 to 10 inches in thickness, is dark-gray or black heavy loam or clay loam. It may rest on siliceous calcareous rock or grade into very friable gray or yellowish-gray calcareous material containing soft white lime concretions and having a high content of very fine sand or silt which gives this material a texture of very fine sandy loam, silt loam, or loam. In a few places the texture is that of silty clay, and the color is a drab gray, mottled with shades of brown and yellow, and in other places the rock material is exposed on the surface with only enough black loam material to fill the cracks and holes between the broken rocks.

The surface soil, in many places, is filled with fragments, small chips, angular gravel, and larger fragments of sandy limestone 6 or more inches in diameter, and in many places the stones are so numerous as to interfere with cultivation. This siliceous limestone is soft where it occurs in the soil, but hardens on exposure. It outcrops on the breaks and forms ledges of nearly continuous rocks, which act as a natural protection against surface erosion. This soil, therefore, has suffered less from erosion and has accumulated more organic matter in the surface soil than has Sumter clay. It is more productive and easier to till.

This soil is small in extent, but it is important agriculturally. It occurs northeast of Darlington, 4 miles north of Oakhill, and 3 to 5 miles northeast of Allenton. It is all under cultivation or in pasture. Cotton, corn, oats, and Johnson grass hay are the principal crops. Yields of cotton are good in favorable seasons. Corn produces from 15 to 30 bushels an acre without fertilizer, and Johnson grass from 1 to 2 tons of hay. The pasture grasses are Dallis, carpet, and Bermuda, together with black medic and other clovers. The grasses and clovers furnish excellent grazing the greater part of the year.

Bell clay.—Bell clay consists of material washed down from the higher lying Sumter, Oktibbeha, Lufkin, and Wilcox soils and deposited along the small drain heads or at the bases of some of the slopes. It is alluvial in origin. Although this type lies above normal overflow of the streams, it constantly receives thin sheets of water carrying soil materials from the adjacent upland slopes.

The surface soil, to a depth ranging from 8 to 12 inches, is dark-gray or black clay containing a large amount of organic matter. It is extremely sticky and plastic when wet but assumes a coarse-granular structure when moderately dry, especially where the soil receives the limy deposits from the Sumter areas. The subsoil is dark-gray heavy plastic clay, which passes, at a depth ranging from 20 to 30 inches, into a yellowish-gray plastic clay, mottled with grayish brown and rust brown, especially in the lower part. This layer generally extends downward 40 to 60 inches before the calcareous material is reached, but in the upper parts of the drain heads and in the Bell areas associated with Sumter clay loam in the eastern part of the county the limy marl material is generally reached at less than 3 feet below the surface. In these shallow areas the entire soil profile is calcareous, but in other areas the surface soil is usually calcareous and the subsoil in places may range from neutral to acid.

This soil is scattered throughout the prairie sections. The principal areas are 4 miles east of Allenton; east, southeast, and southwest of Darlington; and in the northern part around Catherine.

Bell clay is the most productive soil in the prairie region. All of it is under cultivation or is used for pasture. The greater part of it is used for Johnson grass, corn, and some cotton. Near Catherine, okra is produced and sold to the canning plant. Johnson grass hay yields 1 to 3 tons, and corn 25 to 50 bushels an acre. Yields of cotton vary greatly, depending on the prevalence of the boll weevil. The soil is rich in nitrogen and produces a rank stalk growth. The fruit is late in developing, and much of it is destroyed by weevils. In wet seasons this crop may be a complete failure; but in dry seasons, three-fourths of a bale or more an acre may be obtained. Larger yields of okra are obtained on this soil than on other prairie soils. A number of clovers native to this region, together with Dallis, carpet, and other grasses, do well on this soil and furnish excellent grazing most of the year.

Included with Bell clay on the map are scattered areas west of Lee Long Bridge that are flatter and occupy lower positions than the typical soil. This soil occurs in the flat drain heads or borders some of the small drains in the Lufkin areas. The surface soil is brownish-gray to grayish-brown sandy clay or clay loam mottled with shades of brown and gray to a depth of 8 or 10 inches, below which the subsoil is brownish-gray heavy plastic clay mottled with rusty brown and gray. The texture and color of the soil mass are more variable, and more mottlings occur, than in the typical soil. Most of these areas are used for hay or pasture, but a small proportion is planted to corn, sugarcane, and sorgo. The chief hay crop is Johnson grass. The pasture grasses are the same as on the typical soil.

Oktibbeha fine sandy loam.—The surface soil of Oktibbeha fine sandy loam is grayish-brown or brown light fine sandy loam, to a depth of 6 inches, underlain by yellowish-brown fine sandy loam, ranging from 6 to 8 inches in thickness, which becomes heavier and redder with depth. The subsoil is brownish-yellow or yellowish-red; somewhat tough and plastic fine sandy clay or clay to a depth ranging from 30 to 36 inches. The subsoil is generally uniform in color, but may be marbled with shades of lighter or darker brownish yellow and becomes somewhat lighter in both color and texture with depth. The material below the subsoil is light brownish-yellow friable light sandy clay, containing considerable mica and grading into light sandy loam. The presence in the surface soil of small remnants of the limestone layer that once covered the area indicate the influence of this layer on the development of the soil. The layer of limy material which lies directly below the subsoil of Oktibbeha fine sandy loam in other counties is absent in Wilcox County, but the soil has the same economic value and supports the same crops as the typical soil. As mapped, this soil includes small areas of Vaiden fine sandy loam, Oktibbeha clay, and Sumter clay loam.

Oktibbeha fine sandy loam occurs in the northern part of the county east of the river and occupies slightly lower positions than the Sumter soils or the outcroppings of the siliceous limestone or Ripley marl. The largest areas are near Darlington, northeast of Furman, and around Allenton.

About 75 percent of this soil is cultivated. Cotton is the principal crop grown, and yields range from one-fifth to one-half bale an acre under current management. Corn, under ordinary methods, yields from 8 to 15 bushels and is generally grown without fertilizers. Cowpeas, peanuts, sweetpotatoes, and sorgo are grown. Bermuda grass and Johnson grass furnish some pasture. Fertilizer recommendations are contained in the section on Land Uses and Agricultural Methods.

Oktibbeha fine sandy loam is much easier to handle and is adapted to a wider range of crops than Oktibbeha clay. Because of its sandy surface soil, it is well drained, absorbs rainfall readily, and warms early in the spring.

Oktibbeha clay.—Oktibbeha clay, locally known as "red post oak prairie", has a surface soil, ranging from 3 to 5 inches in thickness, of brown or reddish-brown heavy clay loam. The upper subsoil layer, extending to a depth of about 10 inches, is yellowish-red heavy plastic clay, which is generally free from mottlings but in some places is faintly mottled with yellow. Below this is a shallow layer of red clay, mottled with yellow, extending to a depth of about 16 inches. Underlying this, and extending to a depth of 44 inches below the surface, is mottled yellow, red, and gray clay. Yellow becomes dominant with depth, so that the material is almost solid yellow above the layer of marl upon which this soil rests.

The surface soil and upper subsoil layer are acid, but the lower subsoil layer may range from acid to neutral. In places limy material comes near the surface. Both the surface soil and subsoil are heavy plastic clays when wet. Upon drying they become very hard, and check and crack, especially on hay lands, pasture lands, and uncultivated areas. These cracks are irregular in shape, range from about one-fourth inch to more than 1 inch in width, and may extend to a considerable depth.

As mapped, Oktibbeha clay includes areas of Sumter clay, Wilcox clay, and Susquehanna clay that are too small to be separated on a small-scale map. The lime layer in these areas is reached at a depth ranging from 8 inches to 6 or more feet. The deeper coverings occur where Oktibbeha clay borders on Susquehanna clay, Wilcox clay, and the hilly phase of Oktibbeha clay; here the gray mottlings are more prominent in the lower part of the subsoil. Also included are several areas near Rosebud and north of Neenah, which are transitional between Oktibbeha clay and Susquehanna clay. The surface soil and subsoil are strongly acid, whereas the white underlying material is highly calcareous.

The largest areas of Oktibbeha clay occur northwest of Catherine, north of Allenton, and north and northeast of Furman, and small areas are scattered throughout the prairies. Oktibbeha clay occupies gently rolling to rolling low ridge tops and gentle slopes. The ridge tops usually lie above the bordering Sumter areas, and the gentle slopes are below. Natural surface drainage is good, but internal drainage is slow.

Unless handled carefully or protected by terraces, the thin surface covering on this soil will be removed very quickly by erosion, even on the gentle slopes, thereby greatly increasing the difficulty with which the soil is tilled, and impairing its agricultural value.

About 25 percent of the soil of this type is under cultivation, principally to cotton. Yields vary widely, ranging from one-fourth to one-half bale an acre, depending on seasonal conditions, cultural methods, fertilization, and freedom from destruction by boll weevils. It is a fair soil for oats, which yield from 25 to 40 bushels an acre. Corn is grown on the low-lying positions at the bases of hills, and yields are good, ranging from 10 to 12 bushels an acre; very little is grown on the slopes. Johnson grass rotated with oats makes the best hay. The yield of Johnson grass hay ranges from one-fourth to three-fourths of a ton an acre. The remainder of this soil is in pasture, second-growth forest, or idle broomsedge fields. The principal pasture grasses are lespedeza, Bermuda, Dallis, and carpet grasses. Growth of the better grasses is greatly handicapped by broomsedge. The forested areas support shortleaf pine and post-oak and other hardwoods.

Wilcox clay.—Wilcox clay is similar to Oktibbeha clay in color of surface soil but differs from it in having a more mottled upper subsoil layer and a greater depth to the calcareous material. The soil is underlain by indurated gray clay that offers more resistance to weathering than the material from which Oktibbeha clay is derived.

The surface soil, to depth of plowing, which seldom exceeds 4 inches, is dingy-brown or grayish-brown clay. It is sticky and plastic when wet but breaks down or pulverizes into granules when plowed under moderately moist conditions. The subsoil is red or bright-red heavy plastic clay, mottled or streaked with creamy gray. The gray increases with depth, and, at a depth ranging from 14 to 20 inches, the material is mottled red and gray heavy sticky plastic clay, which extends to a depth ranging from 30 to 36 inches. Underlying this is an 8-inch layer of grayish-yellow clay, mottled with gray. Beneath this is a layer of yellow and gray clay which is more friable than the layers above and contains considerable black and brown iron stains or soft iron concretions. This layer is from 8 to 15 inches thick and lies immediately above the parent material of indurated clay. Bordering the limestone soils, and where the clay thins out, calcareous marl may approach within 3 or 4 feet of the surface. Farther west the intervening formation thickens, and the limy material lies from 10 to 30 or more feet beneath the surface.

Most of the soil of this type is uniform in color, but here and there are spots where the surface soil is dark gray or black. This layer is seldom more than 4 inches thick and is underlain by the typical subsoil. On the crests of some of the higher ridges, are several spots, 1 or 2 acres in extent, of greensand marl. This marly material is probably a remnant deposited over the indurated clay, or parent material. Red spots where the surface has been removed by sheet erosion and the subsoil exposed are included also.

On the surface of much of this soil are numerous, somewhat flat or rounded, locally formed, hard iron concretions, ranging in size from buckshot to more than 2 inches.

Wilcox clay occurs in large areas between Catherine and Lamison and in a few small areas in the vicinity of Allenton. It occupies low, broad, elongated ridges having gently sloping sides, leading down to intermittent drainageways. As on the other heavy clay

soils, run-off of rain water is rapid, and the soil is subject to severe sheet erosion where not protected by terraces, grasses, or forest cover.

Drinking water is difficult to obtain, and the dirt roads are impassable in wet seasons. As such conditions are not conducive to agreeable living, only about 20 percent of this soil is under cultivation, largely by Negro tenants. The remainder is in woods, pasture, or open forests of shortleaf pine and of post oak and other hardwoods. Practically all of the cultivated areas are planted to cotton, with small patches of peanuts, sorgo, and peas for home use. Corn is planted across the cotton fields in rows about 20 feet apart and in the low-lying positions. Lespedeza, carpet grass, and Dallis grass afford good pasturage, particularly in the low-lying positions.

Lufkin clay.—Lufkin clay is derived from the same material as Wilcox clay but is lighter colored in both surface soil and subsoil, is more poorly drained, and occupies flat to gently undulating areas. Notwithstanding the favorable relief of Lufkin clay, it is subject to sheet erosion when poorly managed, as both surface soil and subsoil are slowly pervious.

The typical surface soil of Lufkin clay is gray or brownish gray, depending on the content of organic matter. It is sticky and plastic when wet and hard when dry. Once conditioned in the spring, it can be farmed easily throughout the remainder of the season. In many of the cultivated fields, especially on the slopes, the soil has assumed a grayish-brown or rusty-brown color, to the depth of plowing, which seldom exceeds 5 inches. The subsoil, to a depth ranging from 5 to 10 feet, is gray heavy sticky impervious tenacious clay, faintly mottled with shades of brown and yellow. In cultivated fields this is wet and sticky throughout the year, but in idle fields it dries to the point of checking and cracking. This layer grades into gray laminated clay, or the geologic material.

In the lower part of the subsoil, at a depth ranging from 30 to 40 inches, there may be an accumulation of rusty-brown and black iron stains, or soft concretions. This layer is usually from 8 to 10 inches thick and is yellowish gray. This passes into a yellowish-gray or greenish-gray more friable material that rests on partly weathered semi-indurated gray clay. In the vicinity of Catherine, or where the shales thin out as the siliceous limestone soils are approached, calcareous friable material may be reached at a depth ranging from 30 to 40 inches. On the slopes or on areas with good surface drainage, the subsoil colors are brighter and in places resemble those of Wilcox clay.

Lufkin clay lies principally west of Alabama River, extending from the Marengo County line northwest of Catherine in a south-easterly direction to the river bottoms southwest of Lee Long Bridge, and a few small areas are scattered in the eastern part near Allenton.

This soil is difficult to put into good condition in the spring, but when well conditioned, it is fairly easy to farm. In dry seasons, bad cracks do much injury to plant roots and cause loss of much moisture. Of the 25 percent of the land under cultivation, the greater part is devoted to cotton. Yields range from one-fourth to more than one-half bale an acre. The soil produces a good-sized stalk, but the fruit is late in developing, with consequent destruction of young bolls and squares by boll weevils. In the vicinity of

Catherine considerable okra and some beans, corn, tomatoes, and other vegetables are produced for the local canning plant.

According to present farm practices, the best use of this soil is for general farm crops, principally cotton, oats, and vegetables; for pasture; and for forest. Carpet grass, Dallis grass, and lespedeza furnish good grazing in the spring and summer, especially during seasons of high rainfall. The wooded areas support a growth of shortleaf pine and of post oak and other hardwoods.

Corn is generally grown on low-lying areas or is interplanted with cotton, two rows of corn alternating with eight rows of cotton. Profitable production of corn requires the use of mineral fertilizers and the plowing under of leguminous crops. This practice will increase the depth of the surface soil, a prime factor in the production of corn, in addition to providing plant nutrients. Fertilizer recommendations are given in the section on Land Uses and Agricultural Methods.

Lufkin clay, mixed phase.—Lufkin clay, mixed phase, is developed in close association with the limy soils, and, in many places, it is a heavy waxy clay overlying the friable calcareous material. The greater part of this soil, however, has the color and structural profile of typical Lufkin clay but is very heavily spotted with inclusions of other soils, and in practically every field, the surface soil is varicolored. The surface soil of a few small areas is black streaky plastic clay, and on some of the slopes the soil is gray or grayish-brown plastic clay. The limy material is reached at a depth ranging from 6 inches to 5 feet.

The larger areas of Lufkin clay, mixed phase, lie about 3 miles northwest of Catherine, and a few small areas are about 2 or 3 miles northwest of Lee Long Bridge.

About 80 percent of this soil is cleared and was at one time cultivated. Practically all of it is now used for pasture. Small patches here and there are planted to cotton, corn, hay, and sorgo. The yields and fertilizer treatment on this mixed soil are similar to those on Lufkin clay.

Vaiden fine sandy loam.—The surface soil of Vaiden fine sandy loam, to a depth of about 6 inches, is pale yellowish-gray fine sandy loam, underlain by a 2- to 4-inch layer of yellow heavy fine sandy loam which becomes heavier as the subsoil is approached. The subsoil is yellow somewhat sticky and plastic clay, mottled with shades of yellow and red. At a depth of 18 inches it becomes mottled gray, yellow, and red sticky clay. The red disappears with depth. Below 48 inches the material is mottled bluish-gray and brownish-yellow clay. Calcareous material is present at depths ranging from 3 to 8 feet.

As mapped, Vaiden fine sandy loam includes small areas of Oktibbeha fine sandy loam on the higher points and grades into Leaf fine sandy loam at the bases of gentle slopes. The soil varies widely. In the northeastern part of the county 2 to 4 miles north and northeast of Furman, the surface covering is generally deeper and grayer in plowed fields; and 4 miles south of Furman are several fan-shaped areas just north of Hills Creek that have a shallower and much heavier surface soil than typical. The typical soil lies on gentle slopes or fan-shaped areas in the northeastern part of the

county and on gently rolling ridges and slopes at Gees Bend north of Ellis Ferry.

About 75 percent of this soil is under cultivation, principally to cotton. Corn is usually planted across the cotton fields. The cultural methods and the yields of the principal crops are similar to those on Oktibbeha fine sandy loam.

Lufkin clay loam.—Lufkin clay loam differs from Lufkin clay in that it has a lighter textured surface soil. The 4- to 6-inch surface soil is gray or brownish-gray clay loam. The subsoil is similar in color to that of the clay soil. It contains a small amount of very fine sand that gives it a slightly lighter texture, especially in the upper part. This soil lies along the border of the limy soils, and limy material is reached in many places at a depth ranging from 30 to 50 inches.

Included with this soil are areas of very fine sandy loam, too small to be separated on the map. The 4- to 6-inch surface soil is gray very fine sandy loam underlain by a thin layer of yellowish-gray loam which passes into the subsoil typical of Lufkin clay.

Lufkin clay loam lies principally southeast and northwest of Catherine. Practically all of it is cultivated. It is much easier to handle and warms earlier than Lufkin clay. About 50 percent of this soil is in cotton, and the remainder is in corn, okra, turnip greens, beans, and tomatoes.

Catalpa clay.—Catalpa clay is developed on the first bottoms along streams flowing through the prairie soils. It is derived from material washed from both the prairie soils and associated heavy clay soils and deposited over the bottom lands during overflow.

The surface soil of Catalpa clay to a depth ranging from 5 to 8 inches is dark brownish-gray clay which may be mottled with dark brown or rusty brown. When plowed, the surface soil has a brown cast. The subsoil is drab or dark-gray heavy sticky plastic clay, faintly mottled with rusty brown and shades of yellowish gray. In places very few or no mottlings are above 18 inches, but in other places, the mottlings are continuous from the surface downward. Below 24 inches, the subsoil is a lighter drab, and the mottlings are larger and more numerous. The color of both the surface soil and the subsoil are lighter and more yellow near the main stream channels. In many places the stream channels are 10 or more feet deep, giving better subsoil drainage to the soils nearby except during high water. All areas of Catalpa clay are subject to overflow.

On the wide bottoms the areas of Catalpa clay that lie farther from the deep channels are much darker in both the surface soil and the subsoil. The surface soil and the upper subsoil layer are very dark-gray clay with an olive-green cast.

As mapped in Wilcox County, some areas along the channels have a shallow covering of grayish-brown loamy very fine sand or very fine sandy loam. Such areas are found in fairly wide strips along Cedar Creek in the northeastern part of the county, in small patches in other localities, and in narrow strips near the channel along Prairie Creek. This fine sand is subject to change by overflow. In many places Catalpa clay grades imperceptibly into Bell clay, the line of contact being near the boundary of overflow.

Along the smaller streams, where the material is directly derived from limestone soils, the topmost surface soil is calcareous. In other areas the surface soil is neutral to acid, and the subsoil is acid.

Except for those areas that have an overwash of sandy material, Catalpa clay can be worked only under favorable moisture conditions. If plowed when too wet, it puddles and dries into hard clods. If plowed when too dry, the soil turns over in large hard lumps that are difficult to break.

About 15 percent of Catalpa clay is under cultivation. A larger part could be cultivated were it not for overflows that are destructive to both soil and crops. Before the boll weevil came, a large part of this land was planted to cotton. At the present time most of the cultivated area is in corn, sorgo, and Johnson grass. On the better developed portions, corn, without fertilizer, produces from 15 to 50 bushels an acre, with an average of about 25 bushels.

About 70 percent of this soil is in cleared pasture, producing a good growth of Bermuda grass, carpet grass, Dallis grass, and several kinds of clovers. Broomsedge, ragweed, and other coarse weeds greatly retard the growth of the better grasses. The remainder of this soil is in forest of sweetgum, bay, beech, water oak, willow oak, elm, ironwood, maple, ash, hackberry, cottonwood, sycamore, swamp pine, and shortleaf pine.

MISCELLANEOUS SOILS AND LAND TYPES

More than one-half of the area of the county consists of soils and miscellaneous land types not suitable for general farming because of steepness of slope or poor drainage. This group includes Susquehanna clay; Susquehanna clay, hilly phase; Susquehanna fine sandy loam, hilly phase; Guin fine sandy loam, Guin soils, undifferentiated; Oktibbeha clay, hilly phase; Oktibbeha fine sandy loam, hilly phase; Sumter clay, hilly phase; Plummer fine sandy loam; Leaf fine sandy loam, poorly drained phase; Leaf clay loam; Leaf silt loam; Myatt fine sandy loam; Ochlockonee clay loam; Kalmia sand; Augusta silt loam; meadow (alluvial material); swamp; and riverwash. The members of this group have the roughest and most broken relief and occupy the flattest and most poorly drained areas in the county. A wide variation exists in the texture, structure, relief, drainage, and degree of erosion of these soils and phases. Guin soils, undifferentiated, and some of the Susquehanna clay, hilly phase, have the highest elevations and the roughest relief of any soils in the county, whereas meadow (alluvial material) and swamp are the lowest in elevation, flattest in position, and most poorly drained.

Because of the unfavorable relief, the erosion, the inherent low fertility, and the poor drainage of some of the soils, only a very small proportion is cultivated. Most of the hilly phases; Guin soils, undifferentiated; and Kalmia sand are best suited to forestry. Leaf fine sandy loam, poorly drained phase; Leaf clay loam; Leaf silt loam; Myatt fine sandy loam; Ochlockonee clay loam; Augusta silt loam, and some areas of meadow (alluvial material) are not cultivated because of unfavorable drainage and are for the most part in pasture and forest. These soils have agricultural possibilities, and, when more land is needed for crops, a considerable acreage can be drained, reclaimed, and brought under cultivation.

Susquehanna clay.—Susquehanna clay has a 3- to 4-inch covering of heavy gray fine sandy loam or very fine sandy loam, streaked with brown and lighter gray. In cultivated areas the surface soil is soon removed by erosion and the heavy clay subsoil is exposed. In wooded areas the upper 1 or 2 inches may be shaded dark gray by the organic content. The lower inch is usually grayish-brown fine sandy clay streaked with reddish brown and dark gray. The upper subsoil layer, to a depth of about 13 inches, is dark yellowish-red or brownish-red plastic clay, minutely mottled with specks of bright red and yellow. The next layer, extending to a depth of 28 inches, is mottled yellow, bright-red, and gray heavy plastic clay which becomes more gray with depth. This is underlain by yellowish-gray or bluish-gray material, mottled with shades of red. This layer may rest on a gray clay layer or a semi-indurated gray clay at a depth ranging from 50 to 60 inches. Buhrstone may underlie Susquehanna clay at various depths, generally below 60 inches.

As mapped in Wilcox County, this type includes small areas of other types or phases of Susquehanna clay, Oktibbeha clay, and Wilcox clay. West and south of Rosebud are areas of transitional Susquehanna clay and Oktibbeha clay. The soil in these areas is underlain by a layer of Ripley marl, in places developing typical Oktibbeha clay, and in other places the soil is Susquehanna clay. One soil overlaps another to a considerable extent. In places Susquehanna clay has developed a much redder surface soil than is typical. Gravelly areas are indicated on the map by gravel symbols. Most of the gravel is in the surface layer.

Only 3 percent of Susquehanna clay is cultivated. The usual crops are grown, with cotton predominating, but under present economic conditions this soil is not recommended as an agricultural soil. It is best suited to forestry and native pasture. The forest growth ranges from shortleaf and longleaf pines to mixed hardwoods, especially oaks; shortleaf (old-field) pine predominates. Carpet grass grows on the lower lying areas and extends up the slopes of the more sparsely forested areas. Dallis grass also grows on the low areas.

Susquehanna clay, hilly phase.—Susquehanna clay, hilly phase, is very similar to Susquehanna clay except that the former is more hilly and broken and more severely sheet and gully eroded. The slopes of Susquehanna clay, hilly phase, range from 10 to 25 percent, and the soil is one of the most severely eroded in the county. In many places erosion has kept pace with the soil-forming agencies, and the buhrstone, from which the soil is derived, is exposed on the surface. In the main, the surface soil, to a depth ranging from 1 to 3 inches, is brownish-gray clay. This grades into a yellowish-red or reddish-yellow mottled and splotched acid clay subsoil.

Included with this soil are some stony areas near St. Johns Church and southeast of Camden. The stones consist of angular fragments of buhrstone, most of which are fixed whereas others are loose on the surface.

The major areas of Susquehanna clay, hilly phase, are in the south-central and southwestern parts of the county, and smaller areas are scattered throughout the central part.

Less than 1 percent of the soil of this phase is cultivated. It is best suited to forestry and native pasture. Shortleaf (old-field) pine grows very rapidly on this soil. Other tree growth is longleaf pine and mixed hardwoods. Carpet grass and some Dallis grass grow on the lower areas and slopes.

Susquehanna fine sandy loam, hilly phase.—Susquehanna fine sandy loam, hilly phase, differs from Susquehanna fine sandy loam in that the former is more sloping or rolling and has suffered more sheet and gully erosion. The slope ranges from 10 to 25 percent, and sheet and gully erosion have been very severe. Galled areas are present in many places, and as these areas increase in size and number, farming operations are discontinued, and the fields are allowed to revert to forest.

The surface soil, to a depth ranging from 4 to 6 inches, is light-gray fine sandy loam. This grades into pale-yellow or grayish-yellow fine sandy sticky plastic clay. At a depth ranging from 8 to 12 inches below the surface, this grades into highly mottled yellowish-red plastic sticky clay, containing all shades of yellow, brown, purple, and red. The red increases to a depth of 18 or 20 inches, where the gray and yellow predominate.

As mapped, this soil includes small areas of typical soil; small areas of Ruston fine sandy loam, especially on the hill crests; and small areas of other hilly phases, such as those of Ruston fine sandy loam and Susquehanna clay. On about 40 percent of this soil is a noticeable amount of small rounded quartz gravel.

Susquehanna fine sandy loam, hilly phase, is well distributed in all parts of the county. The largest areas are in the vicinity of Pine Apple; northeast, east, and southeast of Oakhill; 1 to 5 miles southeast of Dry Forks; and 1 to 3 miles northeast and 4 miles southwest of Fatama.

Only a small proportion of the soil of this phase is under cultivation. The cultivated areas generally occupy the flatter relief of the ridge tops, the more gentle slopes, and the small fan-shaped areas at the bases of the slopes. The proportion of the gravelly areas under cultivation is about the same as for the rest of the phase.

The crops are similar to those on the typical soil, and the same cultural methods are used. Except where the soil is well protected from erosion or in especially favorable seasons, the returns are smaller. On the whole, under present economic conditions, this soil is best suited to forestry and woodland pasture. The timber produced is shortleaf and longleaf pines, sweetgum, post oak and other oaks, and hickory. Pasturage is provided by carpet grass and underbrush.

Guin fine sandy loam.—Guin fine sandy loam is mapped principally in the northwestern part of the county near Gastonburg and represents a soil condition rather than a definite type. It includes small rolling areas of Ruston fine sandy loam, Orangeburg fine sandy loam, Susquehanna fine sandy loam, Norfolk fine sandy loam, Norfolk loamy sand, and a few areas of Oktibbeha and Vaiden fine sandy loams intricately associated. This land is not nearly so rough or broken in relief as Guin soils, undifferentiated.

The crests of the long ridges generally have a fine sandy loam covering, but the subsoil ranges from the yellow of the Norfolk soils

to the bright red of Orangeburg fine sandy loam and from loamy sand to the heavy plastic clay of Susquehanna fine sandy loam.

Guin fine sandy loam is principally in forest, but approximately 20 percent is under cultivation. Most of the cultivated area is in cotton, and the remainder is in corn and other feed crops. Practically all the tilled soil is worked by tenants who seldom use as heavy applications of fertilizers as are recommended for other soils or seldom turn under cover crops; therefore crop yields are less than those on similar soils where better management is practiced. Most of Guin fine sandy loam is best suited to growing timber; old-field pines do well.

Guin soils, undifferentiated.—Guin soils, undifferentiated, represent intricately mixed soil materials occurring on severely broken relief on slopes ranging from 20 to 40 percent. The surface features of these undifferentiated soils consist of narrow winding ridges, knobs, deep V-shaped valleys and gulches, and a series of rough broken hills surrounding high-lying plateau-like areas. Intermittent streams are cutting back constantly into the good agricultural soil on the high ridges and plateau-like areas. Soil materials, ranging from severe escarpments of the friable upland fine sandy loams of the Red Bay, Orangeburg, and Ruston series to more gently sloping areas of Susquehanna clay on the lower slopes, are included in this classification.

Guin soils, undifferentiated, are well distributed, the largest areas being south of Alberta; 1 to 8 miles north and northwest of Clifton Ferry; 1 to 5 miles northwest, west, and southwest of St. Johns Church; 3 to 8 miles northeast of Camden; and 1 to 3 miles north of Estelle.

This land generally is owned in large tracts as a combination forest and turkey and quail preserve and is best suited for this purpose. Tree growth varies from place to place, according to the character of the soil material. Old-field, rosemary, and longleaf pines; hickory; and the oaks constitute the dominant trees. Beggar-llice, tick trefoil, lespedeza, wild peas, and partridge-peas are native to these soils, and cowpeas, *Sesbania*, and benne can be grown. For best results, each of these crops should be planted in small patches. The seeds produced by these plants are excellent bird feeds, and most of them carry over the winter. Native grasses and insects supply a large part of the summer feeds. In a game preserve, it is advisable to include areas of calcareous soils, as black medic and sweetclover, which are good bird feeds, are especially adapted to this soil.

Oktibbeha clay, hilly phase.—Oktibbeha clay, hilly phase, differs from Oktibbeha clay in that it is more broken and rough and is more severely sheet and gully eroded. The slopes range from 15 to 30 percent. In many places all of the soil material, down to the underlying marl, has been removed by sheet and gully erosion. In the more representative areas, the surface soil, to a depth of 2 to 4 inches, is reddish-brown heavy plastic clay. The upper subsoil layer, to a depth of 8 or 10 inches, is yellowish red with faintly conspicuous mottlings of light gray, red, and yellow. This may continue unchanged to the underlying limy material which ranges in depth from 12 to 24 inches. Generally there is a dominance of yellow, with red and gray fine mottlings as the limy material is approached.

As mapped, this soil includes small areas of the hilly phases of Sumter clay, Oktibbeha fine sandy loam, and Susquehanna clay, all the hilly and broken areas of Wilcox clay, and small areas of Sumter clay, Oktibbeha clay, Oktibbeha fine sandy loam, and Wilcox clay.

This soil occurs near the central part of the county around Rosebud and in the northeastern and northwestern parts.

Less than 2 percent of this soil is under cultivation. Most of it is in forest, comprising essentially the same trees as those on Susquehanna clay, hilly phase. Cotton is the principal crop grown, but lespedeza, wild peas, and beggar-lice are grown on the sparsely forested areas as bird feeds. Carpet and Dallis grasses grow along the stream channels and the lower slopes. This land is best used for forestry and range land.

Oktibbeha fine sandy loam, hilly phase.—Oktibbeha fine sandy loam, hilly phase, is separated from the typical soil on account of its rolling to hilly topography. The fine sandy loam surface soil in the hilly phase ranges from 2 to 10 inches in depth. This soil occurs in association with Sumter clay loam.

Approximately 30 percent of this land is in cultivation, principally to cotton. The cultivated areas are on the gentler slopes and wider ridges and are considered very productive. As mapped, this soil includes areas of Ruston fine sandy loam, hilly phase, too small to be shown separately. The rougher areas are in forest or pasture. The trees consist principally of shortleaf pines and a mixture of hardwoods. The pasture produces Dallis grass, lespedeza, and sedges. In places where lime has influenced the development of this soil, some clovers are grown.

Sumter clay, hilly phase.—Sumter clay, hilly phase, differs from typical Sumter clay in that it is more hilly and broken, occupies slopes ranging from 15 to 30 percent, and is more severely sheet and gully eroded. In many places the surface soil is entirely removed, exposing large areas of Selma chalk or marl of the Ripley formation. The surface soil, to a depth ranging from 1 to 4 inches, is dark-gray to whitish-gray clay. It is sticky and plastic when wet but is very granular and friable under optimum moisture conditions. The subsoil is highly weathered limestone, which is light gray and is very easily broken down mechanically. In places, at a depth ranging from 36 to 48 inches, grayish-blue hard rock is present, which is much more difficult to break down than the overlying material.

As mapped in the county, this soil includes, in a few places, 30 percent of Oktibbeha clay, hilly phase, which occurs as knolls and knobs within the hilly Sumter areas and is generally covered with shortleaf (old-field) pine.

South of Furman, a somewhat continuous hilly broken area of Sumter soils, derived from highly siliceous marl, is included in this phase. Erosion has kept pace with the soil-forming processes; consequently there is practically no surface covering. The partly weathered limerocks are exposed on the surface, and the color of the surface soil is grayish white. Originally this area was covered with an excellent growth of cedar, but at present it has a scrubby second growth of cedar with Osage-orange trees and honeylocust on the lower lying areas and slopes.

The main areas of this soil are in the extreme northeastern part of the county and north of Oakhill, and several smaller areas are northeast of Camden and around Darlington.

All this soil is open land and is used almost entirely for pasture. A few small areas around houses are used as gardens, and occasionally oats or corn are planted on areas where sheet erosion has been less severe. The pastures support a growth of black medic, sweet-clover, and Dallis grass. All these, except Dallis grass, die at the end of the spring months, but during summers of high rainfall the land produces good pastures, except on the galled areas. White clover can be established on the low-lying areas, where it is well adapted.

Plummer fine sandy loam.—Plummer fine sandy loam is similar in color, texture, and structure to Myatt fine sandy loam on the terraces. The surface soil, to a depth of 6 or 8 inches, is dark-gray fine sandy loam or loamy fine sand, containing enough organic matter to give it a dark appearance. The subsoil is gray friable fine sandy loam, mottled with rust brown, yellow, and gray. At a depth ranging from 28 to 32 inches it becomes heavy plastic gray clay, containing some rust-brown mottlings. This soil is an upland soil associated with Norfolk, Ruston, Orangeburg, Red Bay, Susquehanna, and Guin fine sandy loams. It occupies swales and flat shallow depressions in the surrounding soils and receives the run-off waters from them. It is saturated during the winter and spring months but generally dries out during the late summer and fall.

The larger areas of this soil are 5 miles north of Ellis Ferry and 2 miles southeast of Rehoboth.

On the higher lying areas and around the edges, small patches of corn and sorgo are grown. These patches, however, occupy a very small proportion of this soil. Carpet grass and lespedeza are grown for pasture on the better drained portions that are not sufficiently well drained for corn and sorgo. The greater proportion of the soil supports a sparse growth of water-loving trees, such as willow, sycamore, sweetgum, and poplar. In addition, quail feeds in the form of gallberries, blackberries, and partridge-peas are abundantly produced.

Leaf fine sandy loam, poorly drained phase.—Leaf fine sandy loam, poorly drained phase, is very similar to Leaf fine sandy loam, with the exception that it occupies a flatter position, is more poorly drained, and is grayer than the typical soil. The 5- to 7-inch surface soil is pale-gray or dingy-gray fine sandy loam. This grades into slightly plastic gray or light yellowish-gray fine sandy clay containing some rusty-brown and yellow mottlings. At a depth ranging from 10 to 15 inches the subsoil becomes very plastic gray clay mottled with yellow, red, and some brown. A bluish-gray plastic clay is present at a depth of 28 to 32 inches below the surface.

Only a little more than 5 percent of this soil is cultivated. The same crops are grown as are grown on Leaf fine sandy loam, but the yields are usually lower. It is best adapted to sorgo or sugarcane. Cotton and corn are also grown. More than 50 percent of the land is in cleared pastures of carpet grass, Dallis grass, lespedeza, broom-sedge, and coarse weeds and grasses. *Sesbania* and benne are well adapted to this soil and may be planted for quail and dove feeds. The

rest of the land is in forest of water-loving oaks, sweetgum, black gum, poplar, and swamp pine.

Several areas of Leaf very fine sandy loam, poorly drained phase, such as those on Pursley Creek north of Neenah, are included with this soil, from which they differ principally in texture. They are best suited for pasture, and as such they differ very little economically from the fine sandy loam.

Leaf silt loam.—Leaf silt loam differs from Leaf fine sandy loam in having a much finer textured and much shallower surface soil. To a depth ranging from 4 to 6 inches, it is light brownish-gray silt loam mottled with rusty brown. The subsoil, to a depth of 24 or more inches, is yellowish-gray or grayish-yellow plastic silty clay, mottled with red and shades of gray, yellow, and brown in the better drained areas. In the lower lying areas the subsoil is pale yellowish-gray plastic silty clay, mottled with shades of gray and brown or yellowish brown. Red occurs in small specks or is entirely absent.

This soil occurs on creek terraces, chiefly along Goose Creek between Lamison and Kimbrough. It is closely associated with other types of the Leaf series.

About 10 percent of Leaf silt loam is planted to cotton, corn, sorgo, and sugarcane. It is best adapted to sorgo and cotton, but corn can be grown provided it is left thin in the hill. In many places corn is planted at irregular intervals in the cotton rows. Cotton yields between one-fourth and one-third of a bale an acre, and sorgo from 50 to 75 gallons of sirup. Carpet grass, Bermuda grass, lespedeza, and some Dallis grass grow on this soil, making it valuable for pasture. The tree growth is largely sweetgum, black gum, post oak, and other hardwoods, and some swamp pine and old-field pine. The soil is better suited to pasture than to forest.

Leaf clay loam.—Leaf clay loam differs from Leaf silt loam in having a shallower covering of silt loam and in occupying slightly lower positions. The surface soil of Leaf clay loam, to a depth of from 3 to 5 inches, is grayish-brown heavy silty clay loam generally mottled with shades of gray and dark yellow. The subsoil, extending to a depth below 40 inches, is gray or pale yellowish-gray sticky and very plastic clay or heavy silty clay, mottled with rusty brown, yellow, and gray. Very little red appears in the subsoil of this type, and the texture changes little, but the color becomes more gray with depth.

As mapped, this soil includes small areas of other soils of the Leaf series, especially the silt loam.

Leaf clay loam is well distributed throughout the county and occupies terrace positions only slightly above the bottom lands. The largest areas are along the creeks west of Alabama River, especially southwest of Clifton Ferry south of Beaver Creek, and smaller areas are along Pine Barren Creek and near Ellis Ferry. Surface drainage is slow, and subsoil drainage is very slow to poor. Less than 3 percent of this land is under cultivation, usually to cotton or sorgo. Where alluvial wash has been deposited, some corn and hay crops are grown. About 40 percent of the land is in cleared pastures of carpet grass and lespedeza. *Sesbania* and benne, as quail and dove feeds, should do well on the open areas. The remainder of this soil is forested predominantly by water-loving hardwoods, sweetgum, black gum, tupelo gum, poplar, and elm.

Myatt fine sandy loam.—Myatt fine sandy loam is a gray poorly drained soil lying on flat or slightly depressed areas on stream terraces. The 4- to 8-inch surface soil is dark-gray or gray fine sandy loam, mottled with rusty brown and shades of gray and yellow. The subsoil, to a depth ranging from 30 to 36 inches, is gray friable fine sandy loam or light fine sandy clay, mottled with rusty brown and yellow. The darker color of the surface soil, due to its content of organic matter, gradually fades with depth. Below a depth of 36 inches the material becomes heavy, sticky, tough sandy clay mottled with bluish gray, yellow, and rusty brown.

In places the texture is loamy sand in the surface soil with a light fine sandy loam subsoil, and in other places, especially southeast of Asahel, south of McCalls Creek, the surface is very fine sandy loam with a friable very fine sandy clay subsoil.

Less than 1 percent of Myatt fine sandy loam is under cultivation. Probably 20 percent is in cleared pasture of carpet grass and lespezea. The remainder is in forest of water-loving hardwoods—sweetgum, black gum, tupelo gum, and elm—with a few swamp pine trees. Some shortleaf (old-field) pine grows on the better drained areas. Gallberries, blackberries, and partridge-peas, which are very valuable for quail feeds, comprise a large part of the undergrowth. *Sesbania* and benne may be planted around the outer edges. The cultivated areas are used chiefly for the production of corn, sugarcane, sorgo, and cowpeas. Very little or no fertilizer is used. The best use of this soil is for pasture or forest.

Ochlockonee clay loam.—Ochlockonee clay loam differs from Ochlockonee fine sandy loam in having a heavier surface soil and subsoil and in occurring on lower lying areas. It is generally subject to overflow from two to four times a year. The surface soil, to a depth of about 4 inches, is brown or brownish-gray granular silty clay or heavy sandy clay. This is underlain to a depth of about 14 inches by brownish-yellow or grayish-brown smooth somewhat plastic silty clay, usually mottled with shades of gray and brown. In the better drained positions, this subsurface layer is brownish yellow or yellowish brown, with a red cast, and is rather free from mottlings, and in the more poorly drained positions it is pale yellowish gray with dark-brown mottlings. Below a depth of 14 inches, the material becomes mottled dark-brown, yellow, and gray clay or silty clay, which continues to a depth of 3½ or more feet. In the lower positions the color is predominantly gray, mottled with rusty brown.

As mapped, Ochlockonee clay loam includes small areas of Ochlockonee silt loam, Ochlockonee silty clay loam, and Congaree silt loam. Congaree silt loam occurs along the river banks, especially south of Clifton Ferry and both north and south of Lower Peach Tree Ferry. It has a brown friable to mellow silt loam surface soil, 10 to 14 inches thick, with a deep brown or reddish-brown silty clay loam subsoil. Both the surface soil and the subsoil are nearly free from mottlings, but some mottlings may appear in the subsoil at a depth of 28 or 30 inches below the surface. The subsoil contains many finely divided mica flakes.

Ochlockonee clay loam produces fair grazing and good timber but is subject to overflows hazardous to crops; consequently only a small acreage, probably less than 5 percent, is cultivated. The remainder

is used as woodland pasture. It is on this soil that many of the cattle of the county are raised. In winter cattle graze on gray Spanish-moss hanging from the trees and on dry grass and underbrush. The better herds receive supplemental feed, but some herds live through the winter without the additional feed. Carpet grass, Dallis grass, Bermuda grass, lespedeza, and underbrush supply the bulk of the spring, summer, and fall grazing. The forest growth consists of shortleaf pine, oaks, hickory, sweetgum, black gum, magnolia, bay, holly, elm, and maple. The cultivated areas of Ochlockonee clay loam are planted principally to corn, sorgo, hay crops, and some cotton. Cotton is planted along the upper part of Pine Barren Creek and on the included areas of Congaree silt loam south of Clifton Ferry and near Lower Peach Tree. Boll weevil damage is rather high in cotton planted on this soil.

Kalmia sand.—Kalmia sand is closely related to Kalmia loamy fine sand but differs from it in that it contains very little of the finer soil particles such as silt or clay. The surface soil is loose open gray sand, and the subsoil is loose grayish-yellow sand. This sand extends to a depth of 5 or more feet.

Four large areas of this soil, and several small ones are along Alabama River: One is near the mouth of Pine Barren Creek; one is south of the river in the large bend northwest of Millers Ferry; another, locally known as "Sand Island", is about 2 miles east of Clifton Ferry; and the fourth is on the south bank of the river near Yellow Bluff Landing.

This type, as mapped, includes some areas of fine sand. These areas are grayish brown, becoming less brown and more gray with depth. The surface soil and the subsoil are loose and open but more retentive of moisture and organic matter than the sand. Most of these fine sandy areas were once cultivated but are now in pasture.

Very little Kalmia sand is under cultivation, perhaps not more than 5 percent. It is subject to leaching and, in order to produce fair yields, large amounts of cover crops must be turned under yearly and mineral fertilizers should also be used. The soil is adapted to peanuts, early spring crops, and watermelons. Bermuda grass does fairly well on this soil, making it satisfactory for pasture. Mexican-clover also does well for quail feed.

Augusta silt loam.—Augusta silt loam is a brownish-gray poorly drained soil, containing soft iron concretions. It occurs on the low-lying terraces of Alabama River and occupies swales or slight depressions between low ridges of the Wickham soils. A part of it is subject to overflow during abnormally high water. The 4- to 6-inch surface soil is brownish-gray to grayish-brown or brown silt loam. The subsoil, to a depth ranging from 20 to 24 inches, is hard somewhat tough grayish-yellow silty clay, mottled with shades of yellow, gray, and brown. In the wetter areas, the subsoil is yellowish gray, mottled with rusty brown, and in places is specked with red.

Small yellowish-brown to nearly black iron concretions, ranging from one-sixteenth to one-fourth inch in diameter, occur in the surface soil and generally in the subsoil. These concretions are soft and easily crushed, except those on the surface, the crushing of which may require considerable pressure with the fingers. In the lower subsoil layer, the material is mottled bluish-gray, yellow,

and brown heavy micaceous silty clay, which is brittle and crumbles easily. The concretions in the lower part of the subsoil or in the material below are larger but much softer and are not easily removed from the rest of the material without crushing.

The largest areas of this soil are east of Clifton Ferry and in Canton Bend north of Millers Ferry. Most of the land north of Millers Ferry is cleared and was once cultivated but has been abandoned and is now either idle or in pasture.

Probably 8 percent of Augusta silt loam is cultivated. The cultivated areas are best used for the production of corn, oats, cotton, sorgo, and hay crops. For the production of oats, artificial drainage is generally necessary. Strong work animals or power machinery is needed in the handling of this soil. It is a fair soil for pasture and is adapted to carpet grass, Bermuda grass, and lespedeza. Bird feeds, such as *Sesbania*, benne, and partridge-peas should do well.

Meadow (alluvial material).—Meadow (alluvial material) occurs along the creeks and small streams in practically all parts of the county. The largest areas lie along Pine Barren and McCalls Creeks, and many narrow strips lie along small streams. The materials composing this land type have been washed down from the upland soils and deposited at times of heavy rainfall. There is no uniformity in texture, structure, or color of this recently deposited material. Most meadow in this county, however, is sandy, ranging from sands to fine sandy loams, and, because of a large content of organic matter, is dark gray. It is subject to change at each heavy rain; new material may be added in some places, and in other places material may be removed. Flooding, usually for short periods, is frequent.

Only a very small proportion of meadow (alluvial material) has been reclaimed for agricultural purposes. Most of the cultivated areas are along the outer edges and are used for the production of corn, hay crops, sugarcane, sorgo, and fall garden crops. Large yields are obtained without fertilization. Meadow (alluvial material) furnishes fair to good grazing throughout the year, producing carpet grass, Bermuda grass, and lespedeza on the open areas and cane and underbrush on the uncleared areas. A large part of meadow (alluvial material) is forested to sweetgum, black gum, and a few shortleaf pine, oak, magnolia, willow, alder, and bay.

Swamp.—Swamp is closely associated with meadow (alluvial material) but differs from the latter in that it is covered with water or is partly saturated throughout the year and is more uniform in texture, color, and structure than meadow. The soil material is heavy somewhat plastic gray clay or clay loam, containing a large amount of organic matter in the 4- to 6-inch surface soil. The lower portion is gray heavy clay, containing some rust-brown mottlings. Draining this land would be extremely difficult and expensive; therefore the land is used for forestry and game preserves. The forest growth consists principally of cypress, tupelo gum, sweetgum, and some swamp pine. Wild ducks feed and hide in these areas. Crops for duck feeds are planted by some of the landowners.

The largest area of swamp is near the mouth of Dunns Creek. Other areas are on the river terraces north, west, and south of Coy, south of Clifton Ferry, north of Millers Ferry, in Gees Bend, and on McCalls and Breastwork Creeks.

Riverwash.—Riverwash occurs on a few small islands in Alabama River, and one area lies adjacent to the river. This land type is principally sand and gravel and a general mixture of material. It occurs in the form of low bars and is subject to overflow. It supports practically no vegetation.

LAND USES AND AGRICULTURAL METHODS

The agricultural system practiced in Wilcox County is essentially the same as that used throughout many of the other counties in the central coastal plains of the State; that is, cotton is the major cash crop, and some revenue is derived from the sale of beef cattle and lumber. The natural characteristics of these soils make them suitable for the production of certain crops, and the farmers are, in the main, taking advantage of these adaptations. The well-developed fine sandy loams of the Ruston, Orangeburg, Red Bay, Norfolk, Amite, Cahaba, and Kalmia series are considered the best soils in the county for the production of cotton, as well as general farm crops and garden vegetables.

Bell clay, Catalpa clay, and Ochlockonee fine sandy loam, and to a limited extent Ochlockonee clay loam seem naturally suitable for the production of corn and hay, and small areas of made land too small to show on the soil map are used for these crops. These soils contain more organic matter than the upland fine sandy loam soils, and the moisture content is fairly high. As corn requires a soil high in organic matter and a good moisture supply, these soils meet the demand for the production of this crop better than other soils in the county. Lufkin clay and Lufkin clay loam soils are best adapted to the production of cotton, oats, peanuts, and vegetables, such as okra, beets, beans, cabbage, and tomatoes; whereas Vaiden fine sandy loam is best adapted to cotton, oats, hay, corn, and grasses. Sumter clay and its associated various phases are used to a certain extent for the production of corn, oats, and sorgo, and are well adapted to the growing of black medic, white Dutch clover, sweetclover, Dallis grass, orchard grass, Johnson grass, soybeans, and, to some extent, alfalfa.

The Guin soils and the hilly and broken Susquehanna soils are largely forested. Some of this land was once cleared and farmed, but sheet and gully erosion have ruined it for crops, and it has reverted to forest. Game preserves are being established in some of these areas, and in spots, these soils are capable of producing the necessary feed for wildlife. Some rather large areas of poorly drained soils, when drained and reclaimed, can be used to a certain extent for the production of corn and pasture grasses. These soils are also well adapted to plants that are especially desirable for quail feeds.

Field tests by the Alabama Agricultural Experiment Station have indicated that the best fertilizers⁵ for cotton on the well-drained medium-textured soils, such as the fine sandy loams of the Norfolk, Ruston, Red Bay, and Orangeburg series, is one that supplies at least 36 pounds of nitrogen, 48 pounds of phosphoric acid, and 24 pounds of potash an acre. To supply these amounts of plant nutrients would require 225 pounds of nitrate of soda or the equivalent,

⁵ TIDMORE, J. W. See footnote 4, p. 15.

300 pounds of superphosphate, and 48 pounds of muriate of potash, or a 6-8-4 fertilizer applied at the rate of 600 pounds an acre. This amount of plant nutrients may also be supplied by an application of 600 pounds of 4-8-4 fertilizer and a side dressing of 75 pounds an acre of nitrate of soda or its equivalent. Many of the mixed fertilizers that have been used for cotton contained more phosphate and less nitrogen than were needed.

If a 3-10-3 fertilizer at the rate of 600 pounds an acre is used under cotton, a side dressing of approximately 112 pounds an acre of nitrate of soda or its equivalent should also be given.

A very large proportion of the mixed fertilizers used in Alabama is 3-8-5. If this material is used at the rate of 600 pounds an acre, and the cotton is side-dressed with 112 pounds an acre of nitrate of soda or its equivalent, the recommended amounts of nitrogen and phosphoric acid would be supplied, but the potash application would be 6 pounds more than necessary. This would be, however, a more profitable fertilizer for cotton by about \$7 an acre than the 3-8-5 without the side dressing.

A large proportion of the farmers use a 3-8-5 or 4-8-4 fertilizer at a rate ranging from 200 to 400 pounds an acre for cotton. The better farmers side dress with nitrate of soda according to the recommendations of the experiment station. The 6-8-4 fertilizer, which needs no side dressing, is gaining in popularity, particularly on the soils less subject to leaching.

According to the Alabama Agricultural Experiment Station recommendations for corn, the light-colored fine sandy loams of the Norfolk, Red Bay, Ruston, and Orangeburg series which have been fertilized with phosphate and potash for other crops should receive 36 pounds of nitrogen an acre (225 pounds of nitrate of soda or its equivalent). This fertilizer should be applied as a side dressing when the corn is about 2 feet high. If corn follows a legume which has been turned under, no nitrate of soda is needed. It is possible that additions of phosphate may be necessary for the most profitable production on bottom land if corn is grown each year.

On Sumter clay and Sumter clay loam and their phases and on Bell clay, the following mixture of pasture grasses is recommended by the agricultural experiment station: ⁶ 10 pounds imported Dallis grass, 10 pounds black medic, and 3 pounds white clover. This should be fertilized with from 400 to 600 pounds of superphosphate. On the heavy clay soils of the county, the recommendation is 10 pounds of imported Dallis grass and 10 pounds of common lespedeza. It is also recommended that 400 to 600 pounds of superphosphate be applied. A liberal application of lime may be necessary. Carpet grass and Bermuda grass are also very valuable pasture grasses, and they may be used to advantage in the low-lying positions.

Some of the better farmers, by liming acid soils, have increased yields of their crops, especially where the lime has been used in connection with the phosphate. Lime is available throughout the prairie section, where it outcrops on the surface in many places. The rotten limestone is soft and crumbly and can easily be loaded on wagons, pulverized, and distributed over the surface of the land. A much

⁶ ALABAMA AGRICULTURAL EXPERIMENT STATION, DEPARTMENT OF AGRONOMY AND SOILS. PASTURES FOR ALABAMA. Ala. Agr. Expt. Sta. Leaflet 7, 8 pp. 1934. (Rev. 1936).

larger quantity of this material than of burned lime would be required.

Some of the farmers grow oats for early spring supplementary feed for work animals. Oats, together with vetch and Austrian Winter peas, furnish some winter grazing. Peas and vetch should be fertilized with 300 to 400 pounds of superphosphate or its equivalent of basic slag applied at the time of planting. Oats are usually fertilized in early spring by an application of about 200 pounds of nitrate of soda.

Sorgo and sugarcane are grown on nearly every farm to make sirup for home use. These crops are generally planted on the moist soils, frequently at the foot of the slopes. The soils with lighter colored subsoils produce the best quality of sirup. Some of the farmers feed sorgo to the work animals, hogs, and cows as a supplement to pasturage.

No definite system of crop rotation is practiced throughout the county, according to the county agent. The general rotation practiced is 2 or 3 years of lespedeza followed by 2 or 3 years of cotton, or corn may be planted the first year. It frequently happens that cotton is planted year after year in the same field, and a similar condition is true for the growing of corn, especially on the soils of the first bottoms. One of the recommendations made by the Alabama Agricultural Experiment Station is as follows: First year, corn and cowpeas (Iron or Brabham) (velvetbeans, soybeans, or peanuts may be used instead), followed by oats in the fall; second year, soybeans, cowpeas, or peanuts; third year, cotton, followed by winter peas or vetch. This rotation can be modified to meet conditions on individual farms. Some farmers, by planting winter cover crops, have prevented much erosion and leaching of the soils. At the same time organic matter has been added, which renders the soil retentive of moisture, and some of the needed nitrogen is supplied.

A number of varieties of cotton and of corn are grown. The most popular varieties of cotton are D. P. L., Cook 307-6, Cook 144, and D. P. L. 11; the principal variety of corn is Whatley Prolific; and of oats, Red Rustproof (Red Texas).

Practically all the farmers raise hogs to supply meat for home needs, and a few have a surplus for market. Hogs are run on pasture during the spring and summer months. A few feed on peanuts, but all are finished with corn at fattening time. The breeds raised are mainly Poland China and Duroc-Jersey, the Poland China being the more popular breed.

The raising of beef cattle is increasing, whereas dairying is declining somewhat. Hereford, Shorthorn, and Aberdeen Angus are the main breeds of beef cattle in the county. Breeders are using purebred bulls with native or grade cows for some of the beef types. The dairy cattle are mainly Jerseys. Beef cattle are shipped to outside markets, mainly by trucks, and from 300 to 400 carloads are marketed annually.

Much of the poorly managed land in the county is badly eroded. Many of the severely eroded slopes and hillsides should never have been entirely cleared of tree growth. Especially is this true of Susquehanna clay and the hilly phases of the Susquehanna, Red Bay, and Ruston soils. Erosion following cultivation of these hillsides has caused the abandonment of thousands of acres of land. Terrac-

ing is not a general practice. Some terraces, particularly of the narrow-base type or so-called hillside type, are in use. Some farmers have constructed broad terraces, and this kind of terracing is recommended by the county agent and the experiment station. In addition to the construction of terraces on these soils which are subject to sheet erosion, the growing of cover crops is strongly recommended.

Kudzu, a fast-growing perennial legume, has a place on practically every farm, as it is well adapted to all well-drained sandy upland soils. Adjacent to the barn lot a large proportion of the farms have a small to large idle area. If these areas were planted to kudzu, the appearance of the landscape would be improved, and at the same time green feed as a supplement for pasture would be provided. Kudzu, when set along ditches and along badly eroded areas, is also valuable for stopping erosion. In feeding value, it compares favorably with other legumes. Kudzu is propagated by the use of root crowns, and extreme care must be taken in the setting of these crowns. A period of 2 or 3 years' growth is necessary for it to develop and become well established. It may be cut and used as a hay crop, used for temporary grazing, or cut and fed in the feed lot as a supplement to pasture during the summer.

The Alabama Agricultural Experiment Station recommendations are dealt with in general in this section. It is suggested that the county agricultural agent, the extension service at Auburn, or the experiment station at Auburn be consulted for more complete information.

MORPHOLOGY AND GENESIS OF SOILS

Wilcox County is situated in the Gulf Coastal Plain in the southwest-central part of the State. It lies in the Red and Yellow soil region where light-colored surface soils with red or yellow subsoils predominate in the mature soils; but this county also contains some areas of Rendzina, locally known as "prairie soils." These Rendzina soils differ markedly from the normal soils of the county, which express the climatic influences of the region, and also differ from the Prairie soils of the middle west. They are derived from calcareous deposits or from heavy clays superimposed upon limy material, to which they owe their grass vegetation and their special characteristics. A humid climate with a mean annual rainfall of about 53 inches and a mean temperature for summer of 80° F. and for winter of 49°, has influenced the development of the normal soils.

Practically all the soils have developed under forest and have supported forests of longleaf and shortleaf pines and mixed hardwoods. The surface soils, except those of Sumter clay loam, black-surface phase, Bell clay, and some of the swampy and other poorly drained soils, are light colored and contain only a small amount of organic matter. In the virgin areas of the forested soils, however, a noticeable amount of vegetable matter is present in the topmost few inches, or a thin covering of leafmold is on the surface. With the exception of Sumter clay loam, black-surface phase, the calcareous soils⁷ have not supported any considerable forest growth.

⁷ In Wilcox County the calcareous soils have developed from Ripley marl, in contrast to the Rendzina soils developed from Selma chalk in other areas. No distinction has been made between Ripley marl and the marls of the Clayton and other geologic formations.

Leaching of alkali and alkaline earth compounds has been rapid, particularly in the sandy soils derived from the unconsolidated beds of sands and clays. In this region of heavy rainfall and warm temperatures, leaching is continuous throughout the entire year. For this reason only a small amount of mineral plant nutrients remain in the sandy surface soil, and the surface soil contains less mineral plant nutrients than the subsoil.

Erosion and gullying are very active in most of the upland soils where poorly managed, especially in the Guin soils and in the hilly phases of Ruston, Red Bay, Susquehanna, Oktibbeha, and Sumter soils, and are responsible for the very rough lands northeast of Camden, north of Pine Barren Creek, west of Ackerville, southeast of Furman, in the Grampian Hills southeast of Camden, in the southwestern part, and elsewhere in the county. Sheet erosion is active on cultivated land in the prairie sections, both on Sumter clay and on the heavy noncalcareous soils, even on comparatively gentle slopes. This is generally true of Rendzina soils. Erosion has brought about much translocation of the finer soil particles and even of the surface soil, resulting in a change in color and texture of some of the soils within comparatively recent years and the destruction of once normal soil profiles.

All the soils in the county, with the exception of those of the Sumter, Bell, and Catalpa series, range from slightly acid to strongly acid. The results of pH determinations on several soil profiles are given in table 4.

TABLE 4.—*Results of pH determinations on seven soil profiles in Wilcox County, Ala.¹*

Soil type and sample no.	Depth	pH	Soil type and sample no.	Depth	pH
Wilcox clay:			Red Bay fine sandy loam:		
417701	0-1	5.0	417727	0-6	6.0
417702	1-4	4.8	417728	6-8	5.3
417703	4-14	4.5	417729	8-50	4.8
417704	14-24	4.5	417730	50-84+	4.2
417705	24-34	4.7			
417706	34-46	5.5	417758	0-2	5.6
417707	46-84+	8.0	417759	2-7	4.6
Vaiden fine sandy loam:			417760	7-18	4.4
417708	0-6	4.7	417761	18-78	4.2
417709	6-10	5.1	417762	78-100+	4.3
417710	10-18	4.6	Norfolk fine sandy loam:		
417711	18-48	4.7	417780	0-7	4.7
417712	48-54	4.8	417787	7-18	5.1
417713	54-66	7.4	417788	18-36	4.6
417714	66-72	8.0	417789	36-42	4.7
Busquehanna very fine sandy loam:			417790	42-56+	4.4
417764	0-3	4.1	Lufkin clay:		
417765	3-6½	4.8	417715X	0-7	5.6
417766	6½-10	4.4	417716X	7-40	4.9
417767	10-19	4.3	417717X	40-50	4.9
417768	19-23	4.4	417718X	50+	6.6
417769	23-36+	4.4			

¹ Determinations made with the hydrogen electrode, by E. H. Bailey, Bureau of Chemistry and Soils.

Seven distinct geological formations underlie the soils of Wilcox County.⁸ From the weathered materials of these formations the soil-forming processes have developed a large number of different soil

⁸ ADAMS, G. I., BUTTS, C., STEPHENSON, L. W., and COOK, W. GEOLOGY OF ALABAMA. Ala. Geol. Survey Spec. Rept. 14, 312 pp. 1926.

types. Over much of the area predominating influences of these parent materials on the soils are evident. In many places these materials have been reworked by the waters of Alabama River and the larger creeks, and the soils formed are not directly related to the underlying material.

The Ripley formation occurs as a comparatively narrow belt across the northern part in the vicinity of Alberta and Rehoboth and north of Millers Ferry. This formation comprises gray to greenish-gray sands and clay and is calcareous in some layers. Beds of heavy clay give rise to the Vaiden and Oktibbeha soils and, in some places, to the Wilcox and Lufkin soils, whereas the sands and sandy clays of this formation are responsible for a variety of soils, most of which have been included in Guin soils, undifferentiated. In the extreme eastern part, this formation is calcareous, and even outcrops of Selma chalk occur along Alabama River northeast of Millers Ferry and southeast of the mouth of Pine Barren Creek. These calcareous materials underlie and give rise to the Sumter soils.

South of the Ripley formation, particularly in the southeastern part in the vicinities of Snow Hill, Furman, Ackerville, Tilden (Dallas County), and Alberta, is the Clayton formation. This consists of white limestone and white to red sands. The topography in places is very broken. On the higher and smoother plateaus the Red Bay, Orangeburg, Ruston, and Guin soils are developed from the sandy materials, and areas of Sumter soils are developed where limestone outcrops.

The Sucarnooche formation lies south of the two previously described formations in a continuous belt extending across the county in a northeast-southwest direction. This formation is gray or dark-gray heavy clay and is calcareous in the lower depths. These heavy clays have had a very definite influence in the development of the Wilcox and Lufkin soils.

Extending across the county and attaining its greatest width in the northwestern corner is the Naheola formation. This formation consists of somewhat red micaceous sand and light-colored sands and clay. It underlies the region in the vicinities of Pine Apple, Caledonia, Oakhill, Neenah, Kimbrough, and Arlington. The soils developed from these mixed materials are not uniform in type but include some small patches of Cuthbert, Susquehanna, and Luverne soils.

Bordering this belt and extending in the same general direction across the county, but of much less extent and of more irregular outline, is the Nanafolia formation, which comprises gray sandstones, clay stones, and laminated clays. These give rise to Susquehanna soils which are in many places characterized by the presence of pseudobuhrstone.

In the southwest are the Tuscaloosa sands and the laminated gray clay sands. The soils developed on them are types of the Ruston and Susquehanna series.

The soils in Wilcox County comprise two main groups: The zonal group, the soils of which have normal profiles; and the intrazonal and azonal groups, the soils of which, because of erosion, poor drainage, lack of aeration, or incomplete oxidation, have not developed normal profiles.

The zonal group includes, among other soils, all the types of the Orangeburg, Ruston, Red Bay, Amite, and Cahaba series; Wickham fine sandy loam; and the better drained areas of Norfolk fine sandy loam and Kalmia fine sandy loam. The most striking features of the profile of these well-developed soils are a comparatively light-textured and highly leached A horizon, a heavier textured B horizon, and a C horizon that in most places is heavier than the A but lighter than the B horizon. These soils show the influence of eluviation in the A horizon and of illuviation in the B horizon. The B horizon is the most intensely colored and the most thoroughly oxidized layer in the profile. The C horizon consists of the unconsolidated geologic material and is extremely variable in structure and color. These soils are the most thoroughly aerated and the best drained. They apparently contain much iron in the form of uncombined ferric oxide. This accounts for the intensely red color, to a depth of several feet, in the B horizon of many of these soils.

Orangeburg fine sandy loam, which is very limited in extent, is one of the normally developed soils. A description of a profile in a virgin area, located one-half mile north of the crossroads at Oakhill, is as follows:

- A₁. 0 to 5 inches, grayish-brown loamy fine sand containing some organic matter in the upper portion and many grass and plant roots, especially in the topmost 2 inches.
- A₂. 5 to 15 inches, brownish-yellow loamy fine sand with a red cast. The red increases and the texture becomes light fine sandy loam with depth, changing to yellowish-red fine sandy loam or loam as the B horizon is approached.
- B₁. 15 to 42 inches, bright-red friable fine sandy clay of no definite structure which breaks easily and crumbles readily into a fine granular mass. The color of an exposed surface is darker red than the freshly crushed mass.
- B₂. 42 to 65 inches, bright-red friable fine sandy clay with a lighter texture than the B₁ layer and a less uniform color which becomes shaded or splotched with slightly lighter yellowish red and, with depth, also becomes slightly mottled with yellow.
- C. 65 to 84 inches+, a light fine sandy clay material somewhat compact in place, but brittle and friable when broken loose. The color is light red streaked with yellow and shades of red and yellow and becomes less red with depth.

Associated with the Orangeburg soil are large areas of Ruston soils which differ from the Orangeburg in having a yellowish-red subsoil, or B horizon, and a more gray A horizon. Ruston soils are intermediate in color between the Orangeburg and the Norfolk soils, the latter having a light A horizon and a yellow B horizon. These soils may be on practically the same elevations, but the Orangeburg soil lies where the drainage and the aeration are better, and it has existed for a longer time. The Norfolk soils occur where aeration is least developed and are usually underlain by a more compact although not necessarily heavier material below the subsoil.

The Red Bay soils have a brown or red A horizon and a red B horizon. The material underlying the B horizon at various depths is a gravelly layer, friable sandy clay, or loamy sand, which gives excellent aeration and deep subsoil drainage. These soils may be on the same elevations as the Orangeburg, Ruston, and Norfolk soils, for example, northwest of Camden; but in scattered areas they generally occupy higher plateaus.

The Susquehanna soils are characterized by either a light-colored sandy surface soil or a reddish-brown clay surface soil with a heavy plastic clay B horizon mottled red, yellow, and gray.

Along Alabama River and some of the larger creeks, extensive areas of soil are developed on the terraces or bench lands. These soils have lain above overflow and have had good drainage and aeration for a sufficient length of time to develop normal profiles. Cahaba fine sandy loam represents the best developed soil on the terraces. It is similar in color and structure to Ruston fine sandy loam. The Kalmia soils, closely associated with the Cahaba soils, resemble the Norfolk soils of the uplands. Amite fine sandy loam, a Red soil developed on the terraces and corresponding to the Red Bay soils of the uplands, occupies areas in which the subsoils are underlain by gravelly or sandy material and have had sufficient time to become thoroughly oxidized. It generally occupies a higher position than the Cahaba and Kalmia soils. The Wickham soils differ from the Cahaba soils in having shallower surface soils and much heavier subsoils. They occur on low ridges on the river terraces. Augusta silt loam, closely associated with the Wickham soils, occurs in shallow swales or slight depressions within the Wickham areas. It is a poorly drained soil with a yellowish-gray or grayish-yellow subsoil highly mottled with rusty brown and shades of gray and yellow and in some places with specks of red. Small soft iron concretions are present in the surface soil and subsoil.

Sumter clay loam, black-surface phase, does not occur to any large extent in this or other counties in the State. A profile description is given, however, because of the way it has developed. Following is a description of a profile as observed one-fourth mile west of St. Peters Church northeast of Allenton:

- A₁. 0 to 5 inches, dark-gray mellow and friable heavy silt loam or clay loam containing considerable very fine sand. It is plastic when wet.
- A₂. 5 to 8 inches dark-gray loam or silty clay loam containing a high proportion of very fine sand. It is plastic when wet.
- B₁. 8 to 12 inches, yellowish-gray loam or light silty clay loam splotched with yellow and containing a few hard lime nodules or fragments of hardened siliceous limestone and considerable very fine sand.
- B₂. 12 to 15 inches, grayish-yellow friable very fine sandy clay loam with a high content of soft lime accumulations and fragments of a soft siliceous limestone.
- C. 15 inches+, partly crumbled gray siliceous limestone. These rock fragments are rather soft until exposed on the surface, where they harden into fairly durable sandy limestone.

Sumter clay loam, black-surface phase, is generally calcareous throughout the entire profile.

The noncalcareous soils on the so-called "post oak prairies" are developed from beds of heavy marine clays superimposed on the calcareous layers, or residual from the weathered calcareous clays. These generally are described locally as "red prairies," "yellow prairies," and "gray prairies." In Wilcox County, Oktibbeha clay, the "red prairie," is limited in extent. It is the best developed and most uniformly oxidized soil of the noncalcareous prairie types.

The Lufkin and Oktibbeha clay soils are derived from similar parent material.

It is of interest to note that the colloids from the Lufkin clay have the highest values for the SiO_2 -sesquioxide ratio; those from the Oktibbeha clay, the

lowest values. * * * The ratios also increase in value with the depth of the horizons from which the colloids were extracted. In other words, the ratio of SiO_2 -sesquioxide decreases in value with the degree of weathering. The data, therefore, show that the Lufkin clay is highly unweathered and the Oktibbeha clay highly weathered. * * *

Wilcox clay is also a "red prairie" soil. It differs from Oktibbeha clay in that the B_1 horizon is highly mottled with yellowish gray. It is closely associated with Lufkin clay, a "gray prairie" soil, and both are derived from the Sucarnooche clays, which are more deeply deposited over the calcareous material than the clays from which Oktibbeha clay and Vaiden fine sandy loam are developed. Wilcox clay occupies the better drained areas on the low broad ridges, and Lufkin clay, the flatter tops. A description of a profile of Wilcox clay, as observed about 1 mile northwest of Lamison, follows:

- A₁. 0 to 1 inch, gray clay with a low content of organic matter.
- A₂. 1 to 4 inches, reddish-brown clay, plastic when wet.
- B₁. 4 to 14 inches, red heavy clay mottled with yellowish gray and creamy gray, very sticky and plastic.
- B₂. 14 to 24 inches, mottled yellow, yellowish-red, red, and creamy-gray very heavy plastic clay.
- B₃. 24 to 34 inches, yellow clay mottled with yellowish red and gray. The stickiness increases with depth, especially in the gray layers.
- C₁. 34 to 46 inches, gray clay splotched with yellow and containing a large amount of dark-brown or nearly black iron accumulations and concretions. The longest axes of some of the concretions are from 4 to 6 inches. The concretions harden upon exposure. This layer is not everywhere present in the upper C horizon.
- C₂. 46 to 84 inches, gray plastic clay mottled with yellow and having white and yellowish-white lime accumulations in the lower part. In this profile the calcareous layer was not reached.

SUMMARY

Wilcox County lies in the southwestern part of the State and is traversed by Alabama River. The topography consists of broad, smooth, almost level, plateaulike areas; level to undulating lands on the second bottoms, or terraces, along Alabama River and the larger creeks; and large areas of sloping hilly and broken relief, which are badly eroded and gullied. Drainage is good to excessive over the greater part of the county. Some flat areas on the uplands, on the first bottoms, and on the terraces are poorly drained, and extensive areas with a rough relief and good surface drainage have poor internal drainage, due to the heavy character of the subsoils.

The mean annual temperature is 65.1° F. The mean annual rainfall of about 53 inches is usually well distributed throughout the year, the dry months being in the fall during the harvest season.

The trend of agriculture at present is toward the production of beef cattle. This county ranks third in the State in the number of cattle. The important crops are cotton and corn, although considerable acreages are devoted to the production of hay and forage crops, and smaller acreages to sweetpotatoes, cowpeas, velvetbeans, peanuts, sugarcane, sorgo, oats, garden vegetables, and okra for canning.

⁹ SCARSETH, G. D. MORPHOLOGICAL, GREENHOUSE, AND CHEMICAL STUDIES OF THE BLACK BELT SOILS OF ALABAMA. Ala. Agr. Expt. Sta. Bull. 237: 42. 1932.

A large number of distinct soils have developed mainly from the several underlying geological formations. The soils, according to their fundamental characteristics and crop uses, have been classed in three groups as follows:

(1) Sandy soils of the uplands and river terraces. On these soils are produced most of the cotton grown in the county and a considerable part of the corn, sugarcane, sorgo, garden vegetables, and many other crops. These soils, because of their texture and open structure, are well drained and warm early in the spring. They possess such good physical properties that under proper management they can be brought readily to a high state of productivity. A wide variety of crops can be produced on these soils.

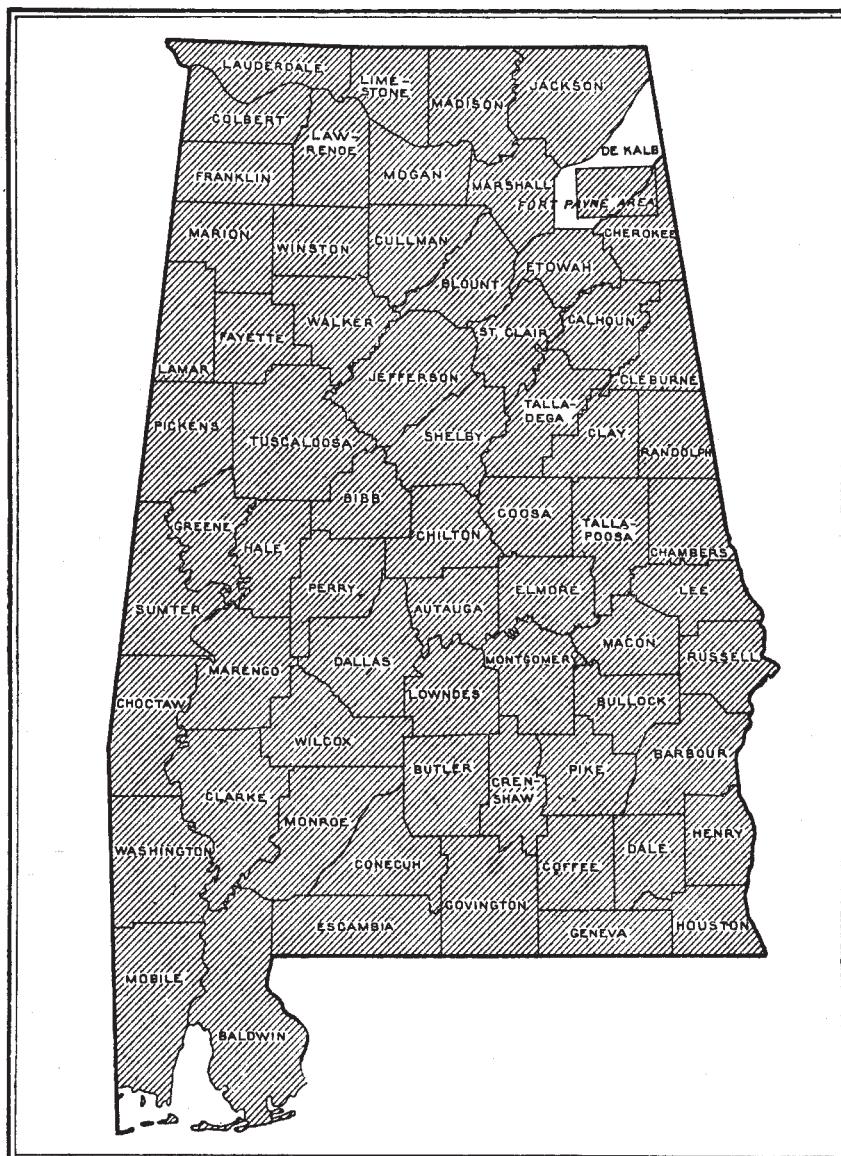
(2) Heavy soils of the uplands and prairies, which include dark-colored limy soils and heavy clay soils. On these soils are large acreages of improved pastures. It is in the section occupied by these soils that cattle raising is expanding.

(3) Miscellaneous soils and land types. Perhaps more than one-third of the land of the county has a sloping rough broken relief, and much of the land is badly eroded and gullied where poorly managed. Such land is best suited for forestry. Included in this group are several of the poorly drained land types and phases which are used to some extent for pasture.



Authority for printing soil survey reports in this form is carried in the Appropriation Act for the Department of Agriculture for the fiscal year ending June 30, 1933 (47 U. S. Stat., p. 612), as follows:

There shall be printed, as soon as the manuscript can be prepared with the necessary maps and illustrations to accompany it, a report on each soil area surveyed by the Bureau of Chemistry and Soils, Department of Agriculture, in the form of advance sheets bound in paper covers, of which not more than two hundred and fifty copies shall be for the use of each Senator from the State and not more than one thousand copies for the use of each Representative for the congressional district or districts in which a survey is made, the actual number to be determined on inquiry by the Secretary of Agriculture made to the aforesaid Senators and Representatives, and as many copies for the use of the Department of Agriculture as in the judgment of the Secretary of Agriculture are deemed necessary.



Areas surveyed in Alabama shown by shading.

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Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the

Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at http://www.ascr.usda.gov/complaint_filing_cust.html and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by:

- (1) mail: U.S. Department of Agriculture
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410;
- (2) fax: (202) 690-7442; or
- (3) email: program.intake@usda.gov.

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